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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1889.

No. 363. 71

THE BUSELL TRIMMER COMPANY AND WILLIAM D. ORCUTT, APPELLANTS,

vs.

FRANK M. STEVENS, HENRY B. CUNNINGHAM, AND SAMUEL N. CORTHELL.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

FILED AUGUST 4, 1887.

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1 & 2 UNITED STATES OF AMERICA, *Massachusetts District*, } *ss:*

At a circuit court of the United States for the first circuit, begun and holden at Boston, within and for the district of Massachusetts, on Saturday, the fifteenth day of May, in the year of our Lord one thousand eight hundred and eighty-six, before the Honorable Le Baron B. Colt, circuit judge.

BUSELL TRIMMER COMPANY *et al.*, Complainants,
v.
F. M. STEVENS *et al.*, Defendants. } In Equity.

The bill of complaint in this cause was filed in the clerk's office on the ninth day of May, A. D. 1884, and was duly entered at the October term of this court, A. D. 1883, and is in the words and figures following:

3 *Bill of Complaint.* (*Filed May* 9, 1884.)

To the judges of the circuit court of the United States for the district of Massachusetts:

The Busell Trimmer Company, a body corporate under the laws of the State of New Hampshire, having a place of business in Nashua, in said State, and a citizen of said State, and William D. Orcutt, of Boston, in the State of Massachusetts, and a citizen of said State, bring this their bill of complaint against Frank M. Stevens, of Boston; Henry B. Cunningham, of said Boston, and Samuel N. Corthell, of Quincy, in said State, and all citizens of the State of Massachusetts.

And thereupon your orators complain and say that heretofore and before the sixth day of January, 1879, William D. Orcutt was the original and first inventor of a certain new and useful rotary cutter for trimming the edges of boot and shoe soles, not known or used before and not in public use or on sale for more than two years prior to his application for a patent therefor.

And your orators further show unto your honors that said William D. Orcutt, so being the inventor of said improvement
4 in rotary cutters for trimming the edges of boot and shoe soles, made application to the proper department of the Government of the United States for letters patent in accordance with the then existing acts of Congress, and duly complied in all respects with the conditions and requirements of said acts, and that on the first day of March, 1881, letters patent of the United States, numbered 238,303, signed, sealed, and executed in due form of law, for the said invention or discovery were issued to said William D. Orcutt, whereby there were secured to him, his heirs, executors, administrators, or assigns, for the term of seventeen years from the first day of March, 1881, the full and exclusive right of making, using, and vending the said invention or discovery throughout the

United States and the territories thereof, all which by said letters patent or by a duly certified copy thereof, now in court produced and shown to your honors, will more fully appear.

And your orators further show unto your honors that on or about the twentieth day of December, A. D. 1880, by certain licences in writing duly recorded in the United States Patent Office, your orator, The Busell Trimmer Company, became the owner of an exclusive license to manufacture and sell rotary cutters under said letters patent No. 238,303, to be used for trimming the edges of boot and shoe soles and heels, all of which by said instruments in writing, with the certificates of the recording thereof thereto annexed, or by duly certified copies thereof, now in court produced and shown to your honors will more fully appear.

And your orators further show unto your honors that the exclusive rights so vested in your orators are of very great value and importance, and that the said patented invention has been extensively used, and that the demand therefor is very large; that your orator, The Busell Trimmer Company, is fully able to supply the said demand.

And your orators further show unto your honors that the rotary cutters for trimming sole edges described in said patent had never been publicly known or used before the application for said patent was filed, on Jan. 6, 1879, but that up to and for some months after that date the only rotary cutters for trimming sole edges then used were greatly inferior in all respects, and that the cutters described in said patent were first introduced into use by your orators in 1879, and but for the unlawful acts of the defendants hereinafter complained of your orators would have the entire market for such cutters; that your orator, The Busell Trimmer Company, early in 1879, prepared for putting such cutters into general use, and at a large expense have built up a very large and profitable business in the manufacture and sale of such cutters and machines of which they form a part; that upwards of 40,000 of the cutters described in said patent have been sold, and that the demand therefor has increased steadily and largely from the fall of 1879, when they were first put into the market by your orators, up to the present time, and is still increasing; that no other rotary cutters for trimming sole edges are now made or used except to a very limited extent, at least ninety-nine per cent. of all rotary cutters now in use being those described in said patent, but that the cutters described in said patent have superseded all other rotary cutters for doing this work, and that the cutters described in said patent are used in upwards of — shoe factories in this country; that your orators have always maintained the price of said cutters at a uniform rate, and that it is essential that they should maintain such price in order that they may receive a fair return for the pains, risk, and expense of establishing their business.

That your orators filed their bill of complaint against the Corthell Manufacturing Company in January, 1882, the said suit being No. 1673 on the equity docket of this court.

That after answer and replication filed proofs were taken by your

orators in support of their bill of complaint and by the defendants in defense, but that before the defendants' proofs were fully taken the defendants consented to a final decree for the complainants, all which by the records of this honorable court will more fully appear.

That as a part of the compromise the following resolution was passed at the meeting of the stockholders of the said Corthell Manufacturing Company:

"Resolved, That in the acceptance of the offer this day tendered to us by the Busell Trimmer Company it is done with the express understanding by all the parties thereto that it is mutually entered into for the purpose of consolidating the several interests of the
6 two companies, and to that end none of the parties in their corporate capacity or as individuals will directly or indirectly enter into the manufacture of trimming machines or cutters for the sole edge of boots and shoes, except in connection with and for the benefit of the two companies as consolidated."

That the defendants Stevens and Cunningham were then stockholders in said Corthell Manufacturing Company and acquiesced in said resolution, and that the defendant Corthell was also a stockholder in said Corthell Manufacturing Company, but had sold his stock to persons interested as stockholders and officers of your orator, The Busell Trimmer Company, in anticipation of the compromise, and that said stock was sold by said Corthell and bought by the purchasers solely because of such compromise.

That the defendants Stevens and Cunningham were employed by your orator, The Busell Trimmer Company, for more than a year in their capacity of machinists to manufacture for your orator, The Busell Trimmer Company, cutters and parts of trimming machines and special tools for making cutters, and were so employed until your orator, The Busell Trimmer Company, learned that they were selling cutters secretly and in violation *to* your orators' rights; and your orators are informed and believe and therefore aver that said defendants Stevens and Cunningham used the special tools belonging to your orators to produce the stock of cutters which they have sold and are now selling in violation of your orators' rights as hereinafter stated.

That the defendant Corthell was employed by your orator, The Busell Trimmer Company, for more than a year and until March 1 of this year, and that within a few weeks after leaving such employ he associated himself with the defendants Stevens and Cunningham in the unlawful sale of the cutters made by said Stevens and Cunningham.

That no others except the said Corthell Manufacturing Company and these defendants have ever manufactured cutters in violation of your orators' rights.

And your orators further show unto your honors that the cutters made and sold by your orator, The Busell Trimmer Company, and the infringing cutters made and sold by the defendants are
7 small, are fac-similes of those manufactured by defendants Stevens and Cunningham for your orator, The Busell Trim-

mer Company, during 1883 and January and February of this year, are easily concealed and transferred from person to person and wear out after a few weeks' use, and that it is extremely difficult to ascertain where they are used, by whom, and to what extent, and that it would be extremely onerous and burdensome for your orators to bring suit against each user; wherefore, if the defendants or either of them shall be allowed to continue their manufacture and sale during the pendency of this suit, your orator will be wholly without adequate remedy in the premises.

Yet the defendants, well knowing the premises and the rights secured to your orators as aforesaid by the letters patent No. 238,303, and utterly disregarding the same, have, at Boston, in said district, and at divers other places in the United States, in violation of the rights secured by said letters patent, and ever since the first day of January, 1884, unlawfully used the said patented invention and manufactured, used, and sold large numbers of cutters each embracing and embodying in its construction and mode of operation substantial and material parts of the invention described and claimed therein as new, and still continue to do so; and the defendants have derived and are still deriving from such use of said invention large gains and profits, but to what extent your orators are ignorant and cannot set forth, and your orators are greatly damaged by such wrongful acts and doings of the defendants, to wit, in the sum of $20,000.

And your orators further show unto your honors that they will be subject to great and irreparable damage unless your honors will grant the relief hereby sought.

To the end, therefore, that the defendants may upon oath full, true, direct, and perfect answer make to all and singular the matters hereinbefore stated and charged as fully and particularly as if the same were hereinafter repeated and they thereunto distinctly interrogated according to the best of their knowledge, information, and belief;

And that the defendants and the attorneys, agents, servants, and workingmen of the defendants may be enjoined perpetually,
8 and also during the pending of this suit, by writs of injunction to be issued by this honorable court, from making, using, or selling the invention patented in said letters patent No. 238,303 or any material and substantial part thereof claimed therein as new;

And that the defendants may be decreed to account for and pay over to your orators all the gains and profits that have accrued to them from using said invention or any material and substantial part thereof claimed in the said letters patent No. 238,303 as new, and that the damages sustained by your orators may be assessed and the defendants decreed to pay over to your orators, in addition to such gains and profits, the damages your orators have sustained by such unlawful acts and doings;

And for such other and further relief as to your honors may seem meet—

May it please your honors to grant unto your orators not only

the writs of injunction conformable to the prayer of this bill, but also the writ of subpœna, directed to said Frank M. Stevens, Henry B. Cunningham, and Samuel N. Corthell, commanding them to appear and answer to this bill of complaint and to do and receive what to your honors seem meet.

And your orators will ever pray.

THE BUSELL TRIMMER COMPANY,
By O. L. NOBLE, *Superintendent.*
WILLIAM D. ORCUTT,
By O. L. NOBLE.

J. E. MAYNADIER, *Of Counsel.*

DISTRICT OF MASSACHUSETTS, *Suffolk,* } *ss:*

BOSTON, *May* 5, 1884.

Then personally appeared before me the above-named O. L. Noble and made oath that he has heard read the foregoing bill of complaint by him subscribed, and that the same is true as to the statements made of his own knowledge, and as to those stated upon information and belief he believes it to be true, and that he is duly authorized to sign this bill.

WILLIAM A. COPELAND,
[SEAL.] *Notary Public.*

9 This cause was thence continued to the May term, A. D. 1884, when the following answer was filed:

Defendants' Answer. (*Filed Sept.* 16, 1884.)

To the judge of the circuit court of the United States for the district of Massachusetts:

The said defendants, reserving to themselves all rights of exception as to all the matters contained in said bill, for answer thereto, or to so much thereof as they are advised to be material to be answered unto, answering, say:

They admit that letters patent of the United States, dated March 1, 1881, No. 238,303, were on that date granted and issued to William D. Orcutt, one of these complainants, but whether his said co-complainants have acquired any right thereunder they are ignorant, and will require complainants to prove the same; and, upon information and belief, defendants deny that the said Orcutt was the original and first inventor of the thing described and claimed in said patent or of any substantial and material part thereof, and deny that the same had not been known or used before the alleged invention thereof by said Orcutt, and deny that the thing patented in said letters patent were or is useful, and aver that the said patent was and is, in part and in whole, invalid and void.

These defendants, further answering, say that they have no knowledge of any license, assignments, or grant under said patent to said

Bussell Trimmer Company by said Orcutt or by any person, except such as is derived from the bill, and require the complainants to prove the same, if material. Defendants, further answering upon information and belief, deny that the said alleged invention is of any value and advantage, or that the complainants have expended large sums of money to introduce the same, or that they have ever had exclusive possession and enjoyment of the same, or that the public have ever acquiesced in any claim by the complainants or either of them to any right or title to such possession and enjoyment.

Defendants, further answering upon information and belief, aver that the specification and drawings of said patent do not show or describe anything capable of being put into practical operation, and also that the said patentee has not given in the said specification, including the drawings, now filed in the Patent Office a written description of his alleged invention and of the manner and process of making and constructing the same and using it in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains or with which it is most nearly connected to make and use the same.

The defendants, further answering upon information and belief, aver that with the state of the art as known and practised at and prior to the date of the said alleged invention for which said letters patent were issued there was no patentable novelty in making, constructing, or using the thing claimed in said letters patent; and these defendants give notice that they will put in evidence, as containing full description of the thing patented in said letters patent, the following-named letters patent of the United States, namely: Letters patent No. 45294, to J. R. Brown, dated Nov. 29, 1864; No. 157,476, to James C. Knights, dated Dec. 8, 1874; No. 207,395, to Samuel N. Corthell, dated August 27, 1878; No. 207,395; No. 212,971, to William D. Orcutt, dated March 4, 1879; No. 97758, to R. F. Burns, dated Dec. 14, 1869; No. 136,790, to Benjamin J. Tayman, dated March 11, 1873, and the several reissues thereof; No. 167,874, to James H. Russell, dated Sept. 21, 1875; reissue thereof, No. 8239, dated May 21, 1878; No. 152,728, to C. F. Davis and E. P. Howe, dated July 7, 1874; No. 188,337, to J. H. Busell, dated March 13, 1877; No. 198,234, J. E. Young, dated Dec. 18, 1877; No. 127,904, to James W. Maloy, dated June 11, 1872; No. 137,066, to B. Gallagher and J. Coyle, dated Mar. 25, 1873; No. 131,140, to Henry F. Wheeler, dated Sept. 3, 1872; No. 192,616, to Augustus Bolling, dated July 3, 1877; No. 173,830, to Nathaniel S. Thompson, dated Feb. 22, 1876; No. 44688, to H. Hodges, dated Oct. 11, 1864; No. 139,694, to Louis Coté, dated Feb. 11, 1873; No. 193,347, to George F. Reed, dated July 24, 1877; No. 15176, to Isaac A. Dunham, dated June 24, 1856; No. 10,239, to J. H., J. M., and H. Q. Thompson, dated Nov. 15, 1853; also the several English patents which were set up in defence in the equity suit 1487, in this district, in which said Busell Trimmer Company *et al.* are complainants and George E. Keith was defendant, to wit, No. 2505, dated Oct. 12, 1863, issued to James John Anderton; No. 220, issued to Benjamin

Mountain, Thomas Richmond, and George Duffield, dated Jan. 23, 1869.

11 These defendants, further answering upon information and belief, say that the thing patented in said letters patent No. 238,303 to Orcutt, upon which this suit is brought, *is* a substantial and material part thereof, claimed as new, was, prior to the alleged invention thereof by the said Orcutt, known and used by the following-named persons at the places respectively stated, namely:

Frank K. Stevens, one of these defendants, at Quincy; J. B. Mann, Isaac Dunham, Varanus Snell, —— Atherton (of the firm of Snell & Atherton), John Kinsley, William Martin, and Melvin Snell, all at North Bridgewater, now Brockton, in Massachusetts, at which said Brockton they then and now reside; and Charles E. Moore and M. L. Wyman (firm Moore & Wyman, machinists), both of Boston, in said State, at said Boston; and Samuel N. Corthell, of Quincy, in said State, at Abington, therein; also Charles Smith, of Chelsea, in said State, at said Quincy and said Boston; also Malcolm W. Long, of and at Hyde Park, and Henry K. Porter, of and at Boston, in said State.

And, further answering, defendants say at and long before the date of said Orcutt's alleged invention rotary cutters which in their construction and mode of operation embraced and embodied all that is shown, described, or claimed in the drawings and specification in said patent No. 238,303 were in common and public use in numerous shops and manufactories throughout the United States, among which were those of J. R. Browne & Sharpe, Providence, Rhode Island; the Providence Tool Company, at said Providence; Pratt & Whitney and Colt's armory, at Hartford, Connecticut; the Ames Manufacturing Company, at Chicopee, Mass.; William Sellers, Thomas Wood, and Bemont & Dougherty, all at Philadelphia; the Singer Sewing Machine Company, at the city and State of New York and at Elizabeth, New Jersey; the Wheeler and Wilson Sewing Machine Company, at Bridgeport, Connecticut; the Ansonia Brass and Battery Company, at said Ansonia; the Bridgeport Brass Company, at Bridgeport; Holmes, Booth & Hayden and the Benedict & Burnham Manufacturing Company, at Waterbury, all in said State of Connecticut; Mellan Bray, at Boston and Quincy; the Putnam Machine Company; the Fitchburg Machine Company, at Fitchburg; A. H. Brainard, at Hyde Park; the Lowell machine shop, at Lowell, and William Mason, at Taunton, all in said State of Massachusetts.

12 And defendants say that for many years prior to the date of the alleged invention for which said patent No. 238,303 was granted it was a common and well-known practice with all mechanics using rotary cutters, and especially so with persons, firms, and corporations and at the shop hereinbefore recited, to make and use such cutters, with teeth or blades formed with flat front faces and having their outer or peripheral ends molded throughout to a uniform shape the converse of the desired shape to be given by the action of the outer and slightly eccentric to rotary path of the cutter, and that cutters were so equally well known and in common

use wherein the teeth or blades were each provided with a flat front face and a slightly eccentric outer or peripheral end having formed thereon ridges, heads, grooves, and any and all desired configurations extending circumferentially across said outer or peripheral face, and said cutters were so formed to cut a path having a configuration of cross-section of any desired form, width, or depth.

And, further answering, defendants say that said Orcutt's said earlier patent, No. 212,971, dated March 4, 1879, shows and describes clearly all that is claimed in said later patent, on which this suit is brought, and that from the date of the issue of said earlier patent, No. 212,971, to Jan. —, 1881, said Orcutt made no claim whatever to the subject-matter for which said later patent, No. 238,303, was finally granted in violation of law, in that the subject-matter thereof should and could have only been claimed by a reissue of said earlier patent; and, further, that the issuing of said earlier patent without claiming therein or in any patent till long afterwards the subject-matter of said latter patent was a dedication and abandonment to the public of said subject-matter, which thereby becomes public property; and hence said latter patent, even though said subject-matter had been first invented by said Orcutt, became and is utterly void and of no effect whatever.

And these defendants deny all unlawful acts wherewith they are by said bill charged and say that the plaintiffs are not entitled to any injunction, account, damages, or other relief prayed for in said bill, without this, that there is any other matter, cause, or thing in the said bill of said plaintiffs contained material or necessary for these defendants to make answer thereto and not herein and hereby well and sufficiently answered, confessed, traversed and
13 avoided, or denied is true, to the knowledge or belief of these defendants; all of which matters and things these defendants are ready and willing to aver, maintain, and prove as this honorable court shall direct, and humbly pray to be hence dismissed with their reasonable costs and charges in this behalf most wrongfully *maintained*.

FRANK M. STEVENS.
HENRY CUNNINGHAM.
SAMUEL N. CORTHELL.

T. W. PORTER,
Solicitor for Defendants.

UNITED STATES OF AMERICA.

STATE OF MASSACHUSETTS, } ss:
County of Suffolk, }

Personally appeared this 9th day of September, 1884, the above-named Frank M. Stevens, Henry Cunningham, and Samuel N. Corthell and made oath that the above answer by them subscribed is true except as to matters stated therein on information and belief, and as to those matters they believe them to be true.

Before me—

EBEN HUTCHINSON,
Notary Public, Suffolk Co., Mass.

This cause was thence continued to the October term, A. D. 1884, when the following replication was filed:

Replication. (*Filed Oct.* 28, 1884.)

These repliants, saving and reserving unto themselves all and all manner of advantage of exception to the manifold insufficiencies of said answer, for replication thereunto say that they will aver and prove their said bill to be true, certain, and sufficient in the law to be answered unto, and that the said answer of the defendants is untrue and insufficient to be replied unto by these repliants, without this, that any other matter or thing in the answer contained material or effectual in the law to be answered unto, confessed and avoided, traversed or denied is true; all which matters and things
14 these repliants are and will be ready to aver, maintain, and prove as this honorable court shall direct, and humbly pray as in and by their bill of complaint they have already prayed.

By their solicitor, JAMES E. MAYNADIER.

This cause was thence continued from term to term to this present term, when, publication of the testimony having passed in the clerk's office, the same is set down for hearing and fully heard by the court, the Honorable Horace Gray, associate justice, and the Honorable Le Baron B. Colt, circuit judge, sitting; and now, to wit, Sept. 14, 1886, after mature deliberation, the opinion of the court is announced and the following final decree entered:

Final Decree. (*Entered Sept.* 14, 1886.)

This cause came on to be heard at this present term and was argued by counsel for the respective parties; and now, to wit, Sept. 14, 1886, upon consideration thereof, it is ordered, adjudged, and decreed that the bill of complaint in this cause be, and the same is, thereupon dismissed, with costs for the defendants, taxed at —.

From this decree the complainants claim an appeal to the Supreme Court of the United States, and give good and sufficient security that they will prosecute their appeal to effect and answer all damages and costs if they fail to make their plea good, and said appeal is allowed.

A true record.

JOHN G. STETSON, *Clerk.*

14*a* The following is the evidence used at the hearing of said cause before said circuit court:

Evidence for Complainants,

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, William A. Copeland, special examiner.

COMPLAINANTS' EXHIBIT CERTIFICATE.

Bussell Trimmer Co., Nashua.

Know all men that we, whose names are hereto subscribed, do by this agreement associate ourselves together with the intent and for the purpose of forming and constituting a corporation according to the provisions of the 138th chapter of the General Statutes of the State of New Hampshire, the acts in amendment thereof and in addition thereto.

The object for which this corporation is established is the manufacture, sale, and applying of the Busell trimmer and all the additions, alterations, and modifications made thereto which are now or may hereafter be rightfully in said corporation's possession, together with all parts of said machine which have been or may be hereafter secured to said corporation by assignment or otherwise of letters patent; also the sale to other parties of the right to manufacture,
use, and sell said patent right or rights in the United States
14b and Territories; also for doing whatever else pertains to the business of developing, improving, using, or selling the rights and interests appertaining to said patent or patents and any and all improvements and modifications of the same.

The places in which the business of this corporation is to be carried on is at Nashua, in the State of New Hampshire, and in Boston, in the State of Massachusetts.

The amount of capital stock to be paid is two hundred thousand dollars, consisting of twenty thousand shares of the par value of ten dollars per share.

The first meeting for organization of said corporation and choice of officers for the same to be held at the Tremont House, in said city of Nashua, on the the ninth day of February, 1880, at four o'clock in the afternoon.

15 The name of this corporation shall be called the Bussell Trimmer Company.

In witness whereof we have hereunto set our hands this ninth day of February, A. D. 1880, at Nashua aforesaid.

JONATHAN DORR,
Boston, Mass.
EDWARD B. TOWNE,
Nashua, N. H.
JOHN H. NORTON,
Boston, Mass.
S. H. HOWE, *Marlboro', Mass.*
HOMER ROGERS, *Boston.*
OSCAR L. NOBLE, *Boston.*

Witness:
E. E. PARKER.
L. F. BURBANK.

STATE OF NEW HAMPSHIRE:

SECRETARY'S OFFICE, CONCORD, *February* 9, 1886.

I hereby certify that the foregoing is a correct copy of the original document received at 3.15 o'clock p. m., and recorded this day.

A. B. THOMPSON,
Secretary of State.

STATE OF NEW HAMPSHIRE:

SECRETARY'S OFFICE, CONCORD, *February* 17, 1885.

I hereby certify that the foregoing is a correct copy of the record. In testimony whereof I have hereinto subscribed my official signature and affixed the seal of the State.

[SEAL.] A. B. THOMPSON,
Secretary of State.

The Bussell Trimmer Co.—Amendment.

The undersigned, a majority of the directors and treasurer of the Bussell Trimmer Company, a corporation organized under and by virtue of the provisions of the General Laws of the State of New Hampshire and in pursuance of the requirements of section (20) twenty, chapter (149) one hundred and forty-nine of said laws, hereby declare and certify upon oath that the capital stock of
16 said corporation has been increased from $200,000.00 to $300,000.00, and the increase of $100,000.00 has been paid in by the conveyance to said corporation of the following-described patent invention, viz., United States patent No. 55002, dated May 22d, 1866, and other good and valuable considerations.

GEO. W. STEVENS, *Treasurer.*
S. H. HOWE,
H. P. KNIGHT,
FRANK WOOD,
CHAS. F. JOHNSON,
A Majority of the Directors.

MIDDLESEX, *ss:*

BOSTON, *May*, 18(8)3.

Their personally appeared the above-named treasurer and a majority of the directors of the Bussell Trimmer Co. and made oath that the above statement by them signed is true.

HOMER ROGERS,
Justice of the Peace.

STATE OF NEW HAMPSHIRE:

SECRETARY'S OFFICE, *May* 19, 1883.

The foregoing is a correct record of an original document received and recorded this day.

A. B. THOMPSON,
Secretary of State.

STATE OF NEW HAMPSHIRE:

SECRETARY'S OFFICE, CONCORD, *February* 17, 1885.

I hereby certify that the foregoing is a correct copy of the record.

In testimony whereof I have hereunto subscribed my official signature and affixed the seal of the State.

[SEAL.] A. B. THOMPSON,
Secretary of State.

17 COMPLAINANTS' EXHIBIT LICENSE 1.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by the Edge Busell Trimmer Company February 12, 1880, recorded in Liber T 26, page 390. Said record has been carefully compared with the original and is a correct transcript thereof.

In testimony whereof I, Benj. Butterworth, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 27th day of February, in the year of our Lord one thousand eight hundred and eighty-five, and of the Independence of the United States the one hundred and ninth.

[SEAL.] BENJ. BUTTERWORTH,
Commissioner.

This agreement, made this first day of December, A. D. 1879, between William D. Orcutt and James H. Busell, both of Boston, county of Suffolk and State of Massachusetts, parties of the first part, and the Busell Edge Trimmer Company, a corporation organized under laws of the State of Massachusetts and doing business in the city of Boston, party of the second part, witnesseth:

That whereas letters patent of the United States for an improvement in rotary cutters for trimming the edges of boot and shoe soles and heels were granted to the said William D. Orcutt March 4th, 1879, and numbered 212,971; and

Whereas one-half of said letters patent was assigned by said Orcutt to the said James H. Busell by his deed of assignment dated March 6th, A. D. 1879, which deed was recorded in the Patent Office at Washington, D. C., on the 14th day of April, A. D. 1879; and

Whereas the party of the second part is desirous of manufacturing rotary cutters containing said patented improvements and using them on machines for trimming the edges of boot and shoe soles and heels:

18 Now, therefore, the parties have agreed as follows:

1st. The parties of the first part hereby grant to the party of the second part an exclusive license to manufacture and sell rotary cutters containing said patented improvements to be used for trimming the edges of boot and shoe soles and heels, and for no other purposes, in the whole territory of the United States to the

full end of the term for which said letters patent were granted, subject to the conditions hereinafter named.

2nd. In consideration of the license hereby granted, the party of the second part agrees to pay to each of the parties of the first part twenty-five cents (25 cts.) upon each and every moulded rotary cutter manufactured and sold by said party of the second part to be used in trimming the fore-part edges of boot and shoe soles, whether made in accordance with the terms of the said patent of Orcutt or not, and said party of the second part further agrees to pay to each of the parties of the first part twenty-five cents (25 cts.) on each and every cutter made and sold by said party of the second part to be used for trimming the edges of boot and shoe heels, except such cutters as are made by it in accordance with the terms of the patent granted to James H. Busell on the 19th day of November, A. D. 1878, and numbered 210,006, and adapted to trim the fore-part edges of boot and shoe soles, so long as the selling price of said cutters can be maintained at one dollar each above the actual net cost of manufacturing the same, and when by the force of circumstances or competition in the trade beyond the control of said party of the second part said cutters cannot be sold for one dollar each over and above the net cost of manufacturing the same, the party of the second part agrees to pay to each of the parties of the first part as a royalty upon each and every moulded rotary cutter manufactured and sold by said party of the second part to be used in trimming the fore-part edges of boot and shoe soles, whether made in accordance with the terms of said patent of Orcutt or not, and upon all moulded rotary cutters manufactured by it to be used for trimming the edges of boot and shoe heels, except such cutters as are manufactured in accordance with the terms of the patent No. 210,006, granted to James H. Busell Nov. 19th, 1878, and adapted to trim the fore-part edges of boot and shoe soles, a sum equal to one-quarter of the difference between the net cost of manufacturing each cutter and the selling price therefor, it being understood that the term "moulded cutter" as used in this instrument is intended to apply to such cutters as are designed to cut a moulding upon the edge of the sole, and are adapted to be sharpened by grinding the front radial or nearly radial face of each tooth of the cutter.

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3d. It is further agreed by the party of the second part that it will keep correct books of account in which shall be recorded the number and date of all moulded rotary cutters made and sold by said party of the second part to be used on fore-part edge-trimming machines and all rotary cutters manufactured by said party of the second part to be used for trimming heels, which books shall be open to the inspection of either of the parties of the first part or their legally authorized agent or agents at all reasonable times.

4th. The party of the second part further agrees to make returns to the parties of the first part on the first days of January, April, July, and October of each and every year of all moulded rotary cutters manufactured by it for use in trimming sole edges and heels, and within thirty days after said first days of January, April, July, and October to pay over to said parties of the first part or

their legal representatives all the royalties accrued and due said parties of the first part for cutters manufactured and sold during the preceding three months, as provided in article second of this agreement.

5th. It is further agreed by and between the parties hereto that in case of infringement of the said patent of Orcutt by other parties or in case of suits for infringement being brought against said Orcutt's patent the parties of the first part shall sign all necessary papers to enable the party of the second part to prosecute suits against all infringers and to defend said patent against suits for infringements whenever in the judgment of the party of the second part it is advisable to do so, and the said party of the second party agrees to pay all expenses of said suits without cost to the parties of the first part.

6th. Upon failure of the party of the second part to make returns or payment of license fees as herein provided for thirty days after the days herein named for making such returns and payment, or upon failure of said party of the second part to use all reasonable exertions to manufacture and keep on sale such cutters in quantities sufficient to supply the reasonable demands of the public therefore, the parties of the first part may terminate this license by serving a written notice upon the party of the second part; and it is also agreed that whenever from the force of circumstances — a legitimate competition in the trade beyond the control of the party of the second part the selling price of said cutters cannot be maintained at one dollar each above the actual net cost of manufacturing the same it shall be optional with the parties of the first part to accept a reduced royalty or terminate this license, which they may do by giving sixty days' notice in writing to the party of the second part; but the party of the second part shall not thereby be discharged from any liability to the parties of the first part for any license fees which may be due to said parties of the first part at the time of the service of either of said notices.

In witness whereof the parties have hereunto set their names and affixed their seals—the Busell Edge Trimmer Company by its president and treasurer—this twenty-first day of January, A. D. 1880.

O. L. NOBLE, *President.* [SEAL.]
S. H. HOWE, *Treasurer.* [SEAL.]
W. D. ORCUTT. [SEAL.]
J. H. BUSSELL. [SEAL.]

In presence of—
J. E. HOBR.

BOSTON, *Feb.* 12*th*, 1880.

For value received, the Busell Edge Trimmer Co. of Boston hereby assigns and conveys to the Busell Trimmer Co. of Nashua, N. H., all its right, title, and interest to the within license.

BUSELL EDGE TRIMMER CO.,
By O. L. NOBLE, *President.* [SEAL.]
S. H. HOWE, *Treasurer.*

In presence of—
HOMER ROGERS.

21 COMPLAINANTS' EXHIBIT LICENSE 2.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by J. H. Busell *et al.*, December 20, 1880, recorded in Liber T 26, page 394. Said record has been carefully compared with the original and is a correct transcript thereof.

In testimony whereof I, Benj. Butterworth, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 27th day of February, in the year of our Lord one thousand eight hundred and eighty-five, and of the Independence of the United States the one hundred and ninth.

BENJ. BUTTERWORTH,
Commissioner.

Whereas an agreement between William D. Orcutt and James H. Busell, both of Boston, and the Busell Edge Trimmer Company, a Massachusetts corporation, was made on or about December 1st, 1879, relating to the exclusive right under letters patent No. 212,971, dated March 4th, 1879, granted to said Orcutt for rotary cutters for sole edges, which agreement is recorded in Liber A 25, page 159, of Transfers of Patents, and has since been assigned to and conveyed to the Busell Trimmer Company of Nashua, New Hampshire, a corporation under the laws of the State of New Hampshire; and whereas said Orcutt has an application for letters patent for improved rotary cutter for sole edges now pending in the United States Patent Office, filed on or about January 6th, 1879:

Now, it is mutually agreed as follows by and between said Orcutt and said Busell Trimmer Company:

First. The said application and any letters patent which may be granted thereon and the invention therein described are included in said agreement above mentioned in all respects precisely as if the articles of said agreement referred in terms to said invention,
22 application, and letters patent, as well as to the patent No. 212,971 and the invention therein described.

Second. The Busell Trimmer Company shall bear all expenses of reviving and prosecuting said application, and agree and bind themselves to do all that may be fairly done to obtain a patent thereon free of expense to said Orcutt; Orcutt to execute all necessary papers for that purpose. Executed in duplicate this twentieth day of December, 1880.

J. H. BUSELL.
WM. D. ORCUTT.
BUSELL TRIMMER CO.,
By O. L. NOBLE,
Superintendent.

Witness:
WM. A. MACLEOD to W. D. O.

22 BOSTON, *Jan.* 19, 1885.

Present: J. E. Maynadier, Esq., of counsel for complainants; T. W. Porter, Esq., of counsel for defendants.

Deposition of John A. Coleman.

Direct examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Int. 1. What is your name, age, residence, and occupation?

Ans. John A. Coleman; Providence, R. I.; 45; occupation, mechanical engineer.

Int. 2. What experience have you had as a machinist and in matters relating to machinery, and also as to comparing inventions described in letters patent?

Ans. I learned my trade at wood and iron work in my father's establishment and worked at it nearly seven years. In that time I invented and made several machines for working in both wood and iron. At the end of that time I went to England to study machinery at the government dock yards. I also studied machinery at various establishments in England and France and in the mechanical museums of both countries.

Soon after returning to America the war broke out, and I was employed as first assistant to the superintendent of the Providence Tool Company armory to aid in organizing a manufactory to make rifles for the Government. My duties required me to superintend the setting up of boilers, furnaces, shafting, machinery, and other appliances necessary to construct arms. I devised and superintended the construction of several machines employed upon the gun work.

23 When the establishment was in complete operation and making 125 guns a day I left and entered the engineering department of the Corliss Steam Engine Co. I aided Mr. Corliss in devising and organizing machinery for the construction of the boilers and steam machinery for two large Government frigates. I devised a machine for making bolts and aided Mr. Corliss in devising machinery for making boilers and others which were applied to different operations connected with the manufacture of steam engines. I was also employed to adjust claims against infringers of Mr. Corliss's patented improvements.

I was then re-engaged by the Providence Tool Co. to superintend their "uptown" establishment for the manufacture of gun barrels, sabres, bayonets, ship chandlery, and coarse hardware, and, of course, in that capacity had the direction of the construction of all new machinery, as well as aiding in inventing it. I then went to Idaho, where I erected a twenty-stamp mill for silver and opened a silver mine.

I invented and put in practice a new method of reducing silver amalgam, and devised and built various machinery for use in the silver business. When that enterprise was fairly upon its feet I came East and was engaged for six years as agent of the Harrison

Boiler Works of Philadelphia. During that time I sold and superintended the erection of a half million dollars' worth of their boilers. At the close of this period I invented a system of heating cities by steam and took out patents therefor. I then went to Europe as agent for the Pratt & Whitney Co., where my duties were to explain to the war departments of the various countries the improvements which we had made in gun-making, with a view to reorganizing their methods of making arms. This compelled me to study the existing organizations in their armories, and, of course, to explain to their engineers the principles and details of our improved machinery. I erected machinery for gun-making at the government armory at St. Etienne, in France. I erected machinery also at the government works of Belgium and Italy, and during that time I devised certain machinery for covering gun projectiles. In Cairo, in Egypt, in company with others, we took a contract for establishing a manufactory of arms in that country, a matter requiring, of course, minute knowledge and careful explanation of details of machinery to the engineers of the war department.

While in Egypt, at the request of the Khedive's chief engineer, I invented and made drawings for a machine for dredging the small canals of the country, the plans of which were approved and accepted by the department.

While in Europe I was obliged to carefully study many patents in connection with the sale of patents, which was entrusted to my charge. On my return to this country, after seven years' absence, I went out to Europe again with horse-nail and horseshoe machinery. I set up the horse-nail machinery and explained its operations, and succeeded in forming two large companies in London—one for the horse-nail and the other for horseshoe manufacture, both of which are in operation.

While in London I invented a horseshoe-nail machine, the patents for which were bought by the horseshoe-nail company.

Since my return to America I have been engaged in constructing machinery and as consulting engineer for manufacturing companies. I have acted at various times as expert in patent cases, dating back to 1873.

Int. 3. Are you familiar with letters patent No. 238,303, granted to William D. Orcutt March 1, 1881, for rotary cutter for trimming the edges of boot and shoe soles, and with the letters patent issued in this country and elsewhere which relate in any way to the art of trimming the edges of boot and shoe soles and with rotary cutters for use on wood and metal? If so, please state what there is that is new in the Orcutt patent, and give such explanation of it in view of the state of the art as you may think necessary to make your meaning clear to the court.

(The patent of Orcutt is now put in evidence and marked Complainants' Exhibit Orcutt Patent in Suit, W. A. C., sp'l ex'r.)

(Objected to as assuming that the Orcutt patent has something new in it.)

Ans. I am familiar with the patents referred to and with wood

and metal cutters. To clearly understand what there is new in Orcutt's device it will be well to understand what work was required to be done and how others had attempted to do it.

26 There are three fundamental cuts with certain subdivisions to be made upon the edge of a shoe sole.

The first is the rand cut; second, the bed cut; third, the guard cut. These may have certain fancy forms or subdivisions. The old hand plane had a blade attached to a handle, and in front of the blade was a guard, arranged with respect to the blade similarly to the wood in a wood plane in respect to its blade.

The blade of the hand tool has a rand guard, a rand lip or cutter, a bed cutter, and a guard cutter upon its outer or molded face, as it is called, and this blade could be ground upon its flat front face without disturbing the contour of its molded face.

This tool could cut all the forms with their subdivisions upon the sole edge of a first-class shoe or boot; but it was a slow tool in its operation, because it was a reciprocating tool, requiring to be pushed forward to make a cut and to be drawn back preparatory to another cut; consequently a portion of the time of its operation was lost. The desideratum in sole-trimming was increased speed, and many minds were directed to obtain this result by substituting the rotary or cut-all-the-time principle for the reciprocating or cut-part-of-the-time principle. This was attempted to be accomplished by making rasp or burr teeth upon the peripheries of cylinders, but the employment of burr teeth ran the inventors into difficulties, for to make a cutter with such teeth having the forms necessary to cut the rand, bed, and guard upon the same tool would have required a sort of sculpture in steel for each tooth, and as these cutters would soon become dull they would require to be sharpened by files, necessitating annealing the cutters for that purpose, even if it were practical to file them, which it was not in an economical sense. Provided these cutters could have been so filed, they would have required to have been annealed and rehardened for each filing, which would spoil them after three or four operations; consequently, in order to make the system of burr-cutters work, only plain forms could be adopted, and the first patent which we find upon that subject is Moliere, No. 13063, June 12, 1855, who shows a cylinder having burr teeth upon its periphery used with a rand guard. This cutter cut only the bed of the sole.

Anderton, English patent 2505, 1863, describes in a somewhat vague manner a similar cutter, but the description is not
27 such, in view of the state of the art at the time, as would have enabled a man ordinarily skilled in the art of tool-making to have made it.

Gubault, English patent No. 879, of 1868, also shows a burr-cutter, and he describes file-like teeth upon the edge or face intended to trim the edge of the sole or heel.

Hodge, No. 44688, Oct. 11, 1864, shows a burr-cutter which could only cut a bed and used with a rand guide.

Coté, No. 135,694, Feb. 11, 1873, shows also a cutter with burr teeth designed to trim the bed of the sole, showing also a gauge-

sleeve slipped over the cutter to gauge the width at which the sole might be cut.

The first advance beyond the point of cutting only one of the three fundamental forms upon the sole edge is shown by Tayman, No. 136,790, March 11, 1873, who made a burr-cutter which would trim two of the three fundamental forms, namely, the rand and the bed. This he did by slicing his cutter into three parts or disks having burr teeth upon their peripheries. Two of these disks had their teeth cut obliquely to the axis of the cutters to make a shearing cut, and these two combined trimmed the bed of the sole, while the third, which was combined with them, trimmed the rand. The cutters were used with a rand guide.

Various other parties took out patents for improvements in sole-trimming, but up to Knight's time they were all burr-cutters substantially like those described. Up to this time all these burr-cutters required to be sharped with a file, necessitating annealing and rehardening at each filing, and they could be used upon only the coarsest description of shoe, and had merely competed as far as they went with the old hand knife in most cases and the hand rand knife in only one.

J. C. Knights, No. 157,476, Dec. 8, 1874, shows the first marked improvement in the cutter teeth. He provided a trimming tool with a series of cutters projecting from the periphery of a hub, all made from one piece of metal, and these cutters or teeth were beveled at their outer edges, forming chisel edges, and this cutter was used with a rand guard.

For the first time a rotary cutter appeared which could be sharpened by an emery wheel and without drawing its temper;
28 but it is obvious that this mode of sharpening would admit only plain outward curves or straight edges to exist upon the outer edges of the teeth.

(Noon recess.)

This Knights cutter trimmed only the bed; therefore dropped down from the position occupied by Tayman, who could cut two of the fundamental forms, while Knights could cut only one.

Next, Busell, No. 167,874, Sept. 21, 1875, shows a burr-cutter with spiral teeth, and this cutter has a rand knife consisting of a bar of steel sharpened upon opposite edges at each end, and this bar is placed in a slot cut across one end of the burr-cutter, and this bar is attached to a spring shaft inside of a hollow shaft which drives the burr-cutter. The revolution of the burr-cutter causes the revolution of the rand knife also. The rand guard is stationary and has a recess within it, in which the rand knife revolves. This structure was intended to trim two of the fundamental forms upon the shoe-sole edge. The rand knife could be sharpened without drawing its temper, but the burr-cutter required to be annealed, filed, and rehardened in the old way which preceded the method shown by Knights.

Another patent to Busell, No. 188,337, March 13, 1877, shows a rand knife, a Knights cutter, and a sleeve surrounding the arbor for driving the cutter, and this sleeve has teeth upon its edge designed

to trim the feather edge from the lower corner of the sole. This sleeve is flexibly adjusted upon the arbor by a spring, which exerts a gentle pressure sufficient to trim the feather edge, but evidently not designed to cut the solid substance of the sole. Consequently it would follow the sinuosities of the sole, but would not gauge it to any regular thickness. The structure was not in any proper sense a cutter which would trim in a mercantile manner the three fundamental cuts upon a first-class sole.

In Bolling, 192,616, July 3, 1877, a plain bed-cutter is shown with a rand guide, but no rand-cutter. A sleeve is shown upon the arbor driving the cutter, having teeth sliding in between the teeth of the bed-cutter, and this sleeve is adjusted laterally and fixed at any given point, according to a given thickness of sole to be cut, and the sleeve is maintained in that position to trim the guard or lower corner of the sole. This structure could cut only two of the fundamental forms required by a first-class sole, namely, the bed and guard.

29 In Corthell patent, No. 207,395, Aug. 27, 1878, a cylindrical hub is shown having a series of blades inserted in its periphery, with permanent, irregular cutting edges on the front face thereof, upon which is shown the forms necessary for cutting the rand, bead, and bed, but showing no form for cutting the guard. These cutters were designed to be ground upon their outer or peripheral edges, and the cutter was used with a rotary rand guide, as shown in the drawing. This cutter could cut only two of the fundamental forms of a first-class cutter, with the exception of the subdivision of the rand cut, called the bead.

Going back to Thompson, No. 10239, Nov. 15, 1853, a cutter is shown similar to that used upon molding cutters for wood frames, etc. This cutter was placed in a proper head situated at the upper end of a vertical arbor, and revolved like all wood-cutters. A permanently fixed gauge was placed in the same plane with the cutter head above it, and the sole (detached from the shoe) was fastened to a pattern form, and this pattern form, operating against the fixed gauge, allowed the cutters to shape the sole in conformity with it.

So much for the rotary shoe-trimmers.

Going back now to see what others did in the attempt to trim soles in a more rapid manner than that of the old hand plane, it is apparent that so limited had been the range and so unsatisfactory the operation of rotary cutters, that many were dissatisfied and disbelieved in the principle of rotation, and their efforts were directed to the embodiment of the old hand plane in an automatic machine. Large machines were made of most complicated structure, requiring great thought and ingenuity in the endeavor to imitate the movements of the hand in the guidance of the old hand tool. These efforts are indicated in the patent of Lambert, No. 80828, Aug. 11, 1868; and, again, No. 115,219, May 23, 1871; No. 142,029, Aug. 19, 1873; to Glidden, No. 130,212, Aug. 6, 1872; to Addy, No. 142,756, Sept. 16, 1873; Addy, No. 201,977, April 2, 1878; Fairfield & Messer, No. 143,682, Oct. 14, 1873, and to Southall, No. 193,622, July 31, 1877.

All this ingenuity, effort, and expense had not succeeded in producing a machine tool which could successfully compete with the old hand tool.

These structures represent large machines composed of cams, levers, ears, and other intricate devices known to the me-
30 chanic arts, and the efforts to render the machine a substitute for the hand tool to successfully trim a sole went on simultaneously with the efforts to improve the rotary sole-trimmers. Both appear to have been equally unsatisfactory in their results.

We now come to Orcutt's structure. In patent No. 238,303, March 1, 1881, Orcutt shows a cutter having blades upon the periphery of a cylindrical hub, and upon the outer edge of each blade was shown a rand-cutter, a bed-cutter, and a guard-cutter, and each blade had a flat front face which could be ground without disturbing the contour of the peripheral or outer edge of the cutters. The molded or outer edge of these cutters was eccentrically inclined to the axis of the cutter to afford a clearance in cutting. These cutters could be ground until worn out without in the least disturbing the molded surface already designated. This structure was adapted to be used with a rotary rand guide. For the first time in the history of the art as shown by the records a cutter was presented which had upon it the means for making the three fundamental cuts upon a sole—namely, the rand, bed, and guard, with their subdivisions, all of which forms could be ground in a few seconds without skill without disturbing the contour of their molded peripheral edges.

We turn now to Brown's patent, No. 45294, Nov. 29, 1864, which shows a tool for cutting metal gear teeth. There are teeth upon a cylindrical hub, and these teeth have a surface upon their peripheral faces and their sides the converse of the space to be cut between gear teeth. This form upon the outer edge and sides of the teeth is cut eccentrically to the axis of the cutter. The front flat face of each tooth was intended to be ground.

The blade of the old hand plane was composed of several ingredients—first, the rand-cutter; second, the bed-cutter; third, the guard-cutter; fourth, a flat front face to be ground, and, fifth, the molded face not to be ground, but which should remain undisturbed until the blade was used up.

The Orcutt cutter was composed of six ingredients—first, the rand-cutter; second, the bed-cutter; third, the guard-cutter; fourth, the flat front face to be ground; fifth, the molded outer surface which should remain untouched until it was used up, and, sixth, the rotary rand guide.

31 The Brown cutter possessed only two of the ingredients which went to make up Orcutt's leather sole-trimmer, namely, first, the flat front face to be ground, and, secondly, the eccentrically cut peripheral or outer face. The Brown cutter was invented to cut metal gears, but somewhere about 1876 Brown discovered that certain other forms for cutting metal might be employed upon his cutters. The method of using Brown's cutters was to revolve their blunt edges at a slow speed against metal firmly held in place in a powerful machine. They continued to be so used, and only so used, up to

the time that Orcutt patented his invention. Employed as they were intended to be, and as they had been up to that time, at a slow rate of speed and with blunt edges, they could not trim a sole in a mercantile sense, nor would the tool even be a scraper as used up to that time. There was nothing illustrated in the cutter nor in the method of using it in the metal art to indicate to any man ordinarily skilled in the art that a shoe-sole trimmer could be made out of such a tool. Brown was a man of extraordinary skill, and he had not penetrated the secret of successful leather-cutting in his researches to construct a cutting tool, for the secret did not lie except in part in his tool, but was hidden in others in an entirely unanalogous art. Further thought and invention, as well as experience outside of his own, was necessary to unite with the two ingredients found in his cutter the other ingredients which were indispensable to a successful leather-cutting tool.

The thousands of people using Brown's tool all over the world in both the metal and leather-cutting arts had never discovered anything more than Brown did, nor had they used the cutters in any different manner nor for any different purpose. Not even the men in the leather art familiar with its demands, who were using Brown's tools to make instruments for the leather-cutting art, had anything indicated by the two ingredients which Brown's tool possessed that that tool could be made into a leather-cutting instrument.

Orcutt had the keen intellectual perception to extract the essence of the old hand plane in the leather art, and to combine it with the two ingredients found in the Brown tool, and he had that quality of mind superior to the general range of that of mechanics to take such ingredients from the old hand tool and arrange them with the further ingredient of the rotary rand guide, and to make a
32 complete and successful structure for trimming leather soles. He made a tool which could cut the three fundamental forms of a shoe sole with their subdivisions as well and far more rapidly than was done by the old hand plane.

The novelty which Orcutt presented was a tool which had all the forms upon it which were requisite for a first-class sole, and which could be instantly sharpened without disturbing those forms until the tool was used up, and this he adapted to be used with a rotary rand guide. The blade of the hand plane *per se* could not have been placed in the periphery of a hub just as it was, because its rand guide was formed by rounding the outer edge of the rand-cutter. If it had been so placed in a cylindrical hub it would have torn the upper leather of the shoe. It was necessary for him to exert his ingenuity to find another means of using a rand guide, and this he did by grinding off the rounded surface of the rand-cutter, and adapt the hand-plane blade to be used with a rotary rand guide, which I regard as new.

Int. 4. There seems to me to be an implication in your answer that the milling or metal-working rotary cutters were used on metal as you have described only up to the date of Orcutt's patent—that is to say, that since the date of that patent these milling tools or rotary

cutters have been used on metal in some other way. Please explain briefly as to this.

Ans. I did not intend that Brown's cutters had been used in any other way since the date of Orcutt's patent, for they have not been used in any other way nor can they be used in any other way than that described for cutting metal.

Int. 5. State whether this new thing described in the Orcutt patent in suit is an invention or not, and state also the grounds of your belief as to that matter.

(Objected to by counsel for defendants as involving matters strictly in the province of the court to pass upon and decide.)

Ans. To my mind this new thing presented by Orcutt is an invention and due solely to him; first, because he alone of the great numbers endeavoring to attain to the excellence of the old hand tool and to increase enormously the quantity of work done by the instrument was the only one to succeed. I judge, from the
33 fact that the old hand plane and all the rotary cutters preceding his were immediately supplanted by his tool, that he had created something which all others had failed to produce. From the fact that his new tool jumped from a sale of four hundred to sixteen thousand in the fourth year of its appearance, and that rotary tools immediately sprang into popularity, I judge that he had done something which had never been accomplished before. I should measure his ingenuity and originality of mind by the vast benefits produced for the public. Upon the millions of shoes and boots trimmed an economy has been effected which I should judge would amount to an enormous sum.

(Adjourned.)

BOSTON, *Jan.* 20, 1885.

(Counsel present as before.)

Up to the time of Orcutt's invention such had been the imperfect character and the limited range of work of rotary trimmers that they had not largely affected the shoe-trimming interest. As previously stated, they could none of them trim the top corner or rand of the sole, the bed, and the guard in a manner demanded by the trade. The Orcutt tool could; consequently a result was produced by Orcutt which had never been produced before by a rotary trimmer. The proof, to my mind, is clear that nothing had been made obvious by any invention which existed previous to his in either the leather or metal working arts which had enabled any man to make a trimming tool such as his. That he showed originality of thought which amounts to invention is evinced, I think, when we consider how many bright minds had been at work for many years to obtain a successful method of trimming a sole as well as and in a more rapid manner than that accomplished by the old hand plane. They had failed and he had succeeded. To indicate how much talent and effort had been spent to accomplish the results that he obtained, we may consider, besides all those who had attempted to make rotary trimmers, the number who had made costly efforts to produce ma-

chines for the employment of the hand tool. The drawings show a great complication of cams, levers, and gears in the construction of large machines which, if they were built, must have cost vast sums of money and certainly did cost long months of study and experiment. These efforts were futile, for they were on the wrong track.

34 During the time that these experiments with both rotary trimmers and the machine hand-trimmers were going on the Brown tool was in existence and daily operation, and had been in operation in the manner prescribed by Brown for fifteen years when Orcutt made his invention, and it continues in use in the same manner up to this day, but no thought or suggestion appears to have been made to minds up to Orcutt's time that the Brown tool contained any feature that would apply to leather-sole trimming. This was natural, for the leather art and the metal art are unanalogous and totally distinct, and the habits of thought of the workmen in the leather art were also distinct from those in the metal art. Brown evidently had no knowledge of leather-cutting, for he had never produced a leather-trimming tool nor shown a proper method of operating such a tool upon the shoe. It required an intimate knowledge of both the leather and metal working arts, ingenuity, thought, and experiment to apply whatever there was in his tool to a successful tool which could trim shoe soles. It required invention. All that Brown had ever made known to the world in this line and which others skilled in the art could imitate had not and could not trim a sole in any mercantile sense.

What Orcutt made known to the world and which could afterwards be imitated by any one skilled in the art would trim a sole in the complete mercantile sense. Orcutt had therefore created through study and experiment something which was new, and something which was wanted in place of all other structures.

To apply a test as to whether Orcutt produced anything worthy the name of invention, let us suppose that he saw the leather trade proceeding in an uneconomical and wasteful manner. By his intimate knowledge of the two arts of metal-working and leather-cutting he sees that he can select ingredients from the two arts, and can produce a tool that will effect an enormous economy in the cost of shoes for the benefit of the public; but, confronted by nice technical reasoning, that old in one art is old in all, he sees that laborious research, experiment, and expense will be entirely thrown away. The natural result would be that he would refuse to martyrize himself merely for the pecuniary benefit of the general public at his expense. He would refuse to proceed, but let the waste go on in the old manner, to

35 the consequent damage of the interests of the public. In other words, invention would stop in this direction at this very point, and he would say, "If I keep my secret let the public help themselves to what they will claim hereafter is old and perfectly obvious." To gain light on the point of invention in this case let us suppose, for instance, that Mr. Noble, a man thoroughly acquainted with the shoe-trimming art, had, previous to the appearance of the Orcutt patent and after experiencing all the failures of the hand and

rotary tools, and possessing a thorough knowledge of the machines for employing the hand tool, had taken a collection of all the appliances for trimming soles from the hand tool up, and, disheartened by the failure of them all to accomplish the work desired, he had gone outside of the leather art to seek aid in, for instance, the wood-cutting art to obtain a proper sole-trimming tool. He would have found in the wood-cutting art sharp knives upon rotary arbors revolving at high speed, but in nowise suited to cutting leather. He would have found nothing in that art that woutd not have torn the work to pieces if he had applied the shoe sole to any of the revolving knives or cutters known in that art, unless other mechanisms were united with them to prevent. He would have obtained no satisfaction there.

Suppose he had now gone to Joseph R. Brown and had asked him for a cutter suitable for properly trimming a shoe sole. He would have received up to that point no satisfaction, because Brown, as shown by his works, had no experience except with metal-cutting; but if Mr. Noble should give him the benefit of his experience in cutting leather, and, beginning with the old hand tool, should enlighten Brown by showing him step by step through all the various experiments which had been made what had been done in cutting leather up to that time, showing him burr-cutters, Knights' cutters, Corthell's cutters, Busell's cutters, etc., the united knowledge of Noble and Brown might very probably have brought forth a tool which would have been a success, and, as it would seem to me, a joint invention of the two men. That tool might have been, probably would have been, identical with Orcutt's. Separately neither of these two gentlemen would have produced anything. Joining together all each knew in his own art, the new structure would have been the result.

36 Now, Orcutt, occupying the relation of machinist and of leather-trimming tool-maker, joined the results of his experience in both the leather and the metal arts, and produced a new article for a new purpose, and producing therefore results hitherto unknown.

Int. 6. Now please make clear the main differences in the mode of operation of the Orcutt sole-edge trimming tools and the metal-working tools, confining yourself to those rotary cutters which are sharpened on their front face and have their peripheries molded.

Ans. The metal-cutting milling tools have a surface velocity, as near as I remember, of, say, twenty feet per minute, more or less, according to the metal to be cut. In other words, they revolve slowly. The metal to be cut must be firmly held in a solid fixture of the machine while the cutter teeth are revolving against it. There could be no possibility of holding a gear, for instance, in the hand while it was being cut by the revolving cutter. The gear to be cut has to be fed up against the cutting tool by a powerful screw or its equivalent.

In using the shoe-trimming tools they revolve at a velocity of seven or eight thousand turns, more or less, per minute. The work to be trimmed by them is lightly, gently, and rapidly passed over

them by hand. It needs no firm fixture, screw, or machinery of any description to apply the shoe sole to the cutting instrument.

In the shoe-trimming tool, when the edge of the sole is passed over it, each tooth cuts the leather slightly and is prevented from gashing into the leather by its top face, which acts as a guard until the cutting edge of the next tooth comes around. The top molded face of the tooth of the metal-cutter does not perform this function of a guard, as the metal to be cut, being firmly held in a powerful fixture, cannot alter its position in relation to the center of the revolving tool—that is, the metal cannot sink below the edge of one tooth and the edge of the succeeding tooth, for if it could it would produce a gouging or uneven cut.

(Noon recess.)

Int. 7. It seems now to be an obvious and simple matter to adapt the Brown style of rotary cutters for metal to the trimming of sole edges. How does that affect your opinion as to whether it was an invention or not to do that?

(Objected to as incompetent, as the question requires the drawing of deductions and conclusions which are entirely within the province of the court.)

37 Ans. I have observed in my own experience as a mechanic and inventor that just in proportion as I had applied long years of study and experiment to a machine and produced simplicity, just in that proportion it was disesteemed as an invention. It seems to me that the same is true in this case. The simple object sought was to cut the three forms necessary upon a first-class shoe sole by machinery which should do the work quicker and as well as the old hand plane. The brightest minds in the leather business had been devoted to this, and the best results that were produced—in fact, the culmination of all the thought devoted to that end was shown in inventions of Busell and Corthell in rotary trimmers and in the invention of the machine designed to use the old hand tool.

These inventions managed to trim the edges of soles in a certain manner, and were recognized without question as inventions embodying great ingenuity and thought on account of their very complexity. The Busell invention, for example, employing the Knights cutter with a rand knife separate from it and a guard-cutter separate from the Knights cutter, made the trimming cuts upon the sole similar in quality of workmanship to that produced by the old hand cutter; but as a tool for every-day use it was very expensive to make, in the first place, and when required to be sharpened the entire structure had to be disintegrated, and as much time required to sharpen each of the three parts as to sharpen the entire Orcutt structure. In the Corthell structure, one of great ingenuity and embodying evident and long-continued thought and experiment, it was difficult to make, as each tooth was separately formed and lips had to be cut to fit into slots which had to be made in the cylindrical hub in which they were placed. It was not a tool which could be practically employed

in all the complex designs required for edges of shoe soles on account of the peculiar manner in which the rand-cutter and guard-cutter were projected upon each tooth, and it could not in all cases be made to work in the same manner as the Orcutt structure—that is to say, practically work, and to be sharpened as an economical cutter. It was ingenious and complicated, and, such as it is, invention is easily recognized in its conception and its working out. In the structures designed to employ the old hand tool automatically
38 invention is easily recognized in the assemblage of the complex mechanical principles which made up those large machines. They were ingenious, novel, and useless as a means of increasing the amount of work which could be done over the old hand tool.

In view of the fact that these various machines were the embodiment of the very best talent known to the trade, and were the culmination of the very best efforts of minds stimulated to the highest degree by self-interest, I regard the quality of mind displayed by Orcutt in being able to reach this result of trimming a shoe sole by his very simple device as displaying invention of a most superior type.

The thing which he did, which now appears so simple, seems to me to be analogous in his line to what Corliss did when he connected the old well-known regulator of a steam-engine to a liberating valve gear in the engine to regulate the movement and economy of the engine instead of leaving the regulator connected to the old-fashioned throttle valve in the steam-pipe. By that means he revolutionized the art of using steam in stationary engines.

This appears to be perfectly simple now, and can be copied by the most ordinary minds, but until he made this simple change the world knew nothing about it and received no advantage from it. It seems to me that the quality of mind evinced by Orcutt in this leather art was somewhat analogous to that of one who condenses the vague wisdom of his predecessors into an epigram. The very simplicity of the Orcutt structure to me is the evidence of the great amount and the high class of thought, and to me displays invention of the purest type.

(The complainants now put in evidence the things marked Exhibit Hand Plane, Complainants' Exhibit Corthell Patent Cutter (patent No. 207,395), Complainants' Exhibit Orcutt Cutter, 1st style; Complainants' Exhibit Busell Cutter (Orcutt patent of '81), Exhibit Rand Guide, Complainants' Exhibit Defendants' Cutters, Defendants' Exhibit Thompson Rand and Sole Edge Trimmer, Complainants' Exhibit Milling Cutter, Complainants' Exhibit Coté Cutter, Knights' Patent; also the following patents: No. 13063, to J. P. Moliere, dated June 12, 1858; No. 44688, to H. Hodge, dated Oct. 11, 1864; No. 135,694, to L. Coté, dated Feb. 11, 1873; No. 136,790, to B. J. Tayman, dated March 11, 1873; No. 157,476, to J. C. Knights, dated Dec. 8, 1874; No. 167,874, to J. H. Busell, dated Sept. 21, 1875;
No. 188,337, to J. H. Busell, dated March 13, 1877; No.
39 192,616, to A. Bolling, dated July 3, 1877; No. 207,395, to

S. N. Corthell, dated Aug. 27, 1878; No. 10239, to J. H., J. M., & H. Q. Thompson, dated Nov. 15, 1853; No. 80828, to R. C. Lambert, dated Aug. 11, 1868; No. 115,219, to R. C. Lambert, dated May 23, 1871; No. 142,029, to R. C. Lambert, dated Aug. 19, 1873; No. 130,212, to C. W. Glidden, dated Aug. 6, 1872; No. 142,756, to C. J. Addy, dated Sept. 16, 1873; No. 201,977, to C. J. Addy, dated April 2, 1878; No. 143,682, to Fairfield & Messer, dated Oct. 14, 1873; No. 193,622, to C. H. Southall, dated July 31, 1877; No. 45294, to J. R. Brown, dated Nov. 29, 1864; English patent No. 2505, of 1863, to J. J. Anderton; English patent No. 879, of 1868, to Gubault.)

Int. 8. Please look at the cutters now shown you, marked Exhibit Defendants' Cutters, and state whether they embody the Orcutt invention or not, in your opinion.

Ans. They appear to me to be the same as those described in complainants' patent.

(Adjourned.)

BOSTON, *Jan.* 21, 1885.

Present: Counsel as before.

Cross-examination by T. W. PORTER, Esq., of counsel for defendants:

Cross-int. 9. Previous to or while learning your trade at your father's establishment, as stated by you, did you devote any time to or have any experience in the manufacture of boots or shoes or in the manufacture of boot and shoe machinery? If so, please state the extent thereof and the nature of such experience.

Ans. I had no knowledge of anything in the boot and shoe making art previous to learning my trade, beyond that found in ordinary boot and shoe making shops where work was done by hand. I commenced learning my trade nearly 30 years ago, and I do not remember hearing at that time of any machinery operated by power that was devoted to shoe-making.

Cross-int. 10. In your preceding answer you speak of a knowledge of shoe-making shops where such work was done by hand. Do you wish to be understood as then having practical knowledge as a workman in such shops or only what you saw done there, or what is your meaning in that respect?

Ans. I speak of the matter only as the curiosity of a boy fond of watching workmen at their trades. I had no other connection with the trade.

Cross-int. 11. You have spoken in your previous testimony of having invented and made several machines for working both wood and iron during your apprenticeship. Did any or either of those machines relate to the art of boot and shoe making? If so, please state to what branch thereof they related.

Ans. They did not relate to shoe-making.

Cross-int. 12. While in Europe, as stated by you, at the end of your apprenticeship and while studying machinery at various es-

tablishments in England and France and in the mechanical museums of those countries, did you devote any time to or take cognizance of the state of the mechanical arts so far as relates to the manufacture of boot and shoe machinery? And, if so, please state the purpose and capacity of the machines in that art which you studied.

Ans. I saw no shoe machinery whatever during that visit. The object of my visit was to acquire a general knowledge of mechanical principles which might apply to any art.

Cross-int. 13. During the time you were first employed as assistant superintendent of the Providence Tool Co., as stated by you, did you in the discharge of your duties there or otherwise give any attention to or acquire any knowledge of the state of the art so far as related to the manufacture of boots and shoes by machinery? And, if so, please state the extent thereof.

Ans. I had nothing whatever to do with the subject of boot and shoe making, so far as I now remember. My attention was devoted exclusively to making guns.

Cross-int. 14. Please to answer the same question with reference to the time that you were employed at the establishment of the Corliss Steam Engine Co., as stated by you.

Ans. I am not quite clear whether I paid any attention to the shoe-making art while engaged with Mr. Corliss or not. I was obliged to travel amongst a great many different classes of manufacturers in connection with Mr. Corliss's business, but I have not a distinct recollection whether I visited shoe-making establishments or not. I may or may not have done so.

41 Cross-int. 15. While thus employed your only duty was to introduce the manufactures of Mr. Corliss, as stated, and those manufactures were in no respect boot and shoe machinery. Is this so? And, if not, please state wherein it is not so.

Ans. My duties were of a very varied character at Mr. Corliss's. A part of the time I was in the drafting department, making and superintending the making of drawings; in the pattern and machine shops, laying out the work and superintending the construction of various machines, and a part of the time engaged at Mr. Corliss's house in devising new machinery; and I was sent to various parts of the country to arrange differences between manufacturers and the Corliss Steam Engine Co. growing out of infringements of Mr. Corliss's patents. I was also sent into the forests of Maryland to select hickory timber and to make contracts for the hickory gear teeth to be used in the Government engines. I had no direct connection, so far as I remember, with the shoe-making art.

Cross-int. 16. Please answer as briefly as you can that part of the preceding question which relates to the question of whether the manufactures of Mr. Corliss at the time you were employed by him related to the manufacture of boot and shoe machinery or not.

Ans. They had no other relation to the boot and shoe art than that some of his engines might have driven boot and shoe making machinery; but whether they did or not I do not now remember.

Cross-int. 17. During your second employment by the Providence

Tool Co. did you have any connection with or devote any time to machinery adapted to the manufacture of boots and shoes?

Ans. Not to my recollection.

Cross-int. 18. While in Idaho, as stated by you, your only relation to boots and shoes or the art of making them was centered in keeping a good pair on your feet. Was it not so?

Ans. Largely.

Cross-int. 19. Was there any exception other than your partial or total failure to accomplish that object? If so, please state what it was.

Ans. The only exception that I remember was in losing one of a large pair in a creek.

Cross-int. 20. While employed as agent of the Harrison Boiler Works, as stated, did you, in the discharge of your duty or
42 otherwise, devote any time to or acquire any experience in the art of manufacturing boots and shoes by machinery?

Ans. I did. My duties in selling boilers required me to visit a great variety of manufacturing establishments, and during the six years devoted to placing the Harrison boilers I visited a great many boot and shoe making establishments, and I put boilers into some of them. I was generally taken through those establishments by the proprietors to witness the operations of making boots and shoes in order to estimate the amount of power required to drive the machinery. Being interested in mechanical operations, I used to spend considerable of whatever spare time I might have during such visits in watching the machinery at work, and thus acquired more or less knowledge of the art of making shoes.

Cross-int. 21. Please give the dates of the six years that you were thus employed by the Harrison Boiler Works Co.

Ans. From 1867 to 1873.

Cross-int. 22. Can you state any shoe establishment that you visited during those years where sole edges were being trimmed by rotary cutters? And, if so, please state whose establishments and where situated.

Ans. Of that feature of shoe manufacturing I have no distinct recollection. I cannot at this date say whether I ever saw a rotary trimmer in any of those establishments or not.

Cross-int. 23. While you were inventing and bringing out your system of heating cities by steam did you give any time or attention to the art involved in the present suit?

Ans. If you mean by your question the art of trimming the edges of soles of shoes I did not.

Cross-int. 24. While in Europe as agent of the Pratt & Whitney Co. and while introducing and setting up machinery in France, Belgium, Italy, and Egypt did you have any occasion to acquire any knowledge of the art of manufacturing boots and shoes by machinery other than that resulting from the employment of rotary cutters as employed in the art of gun-making? If so, please state the extent thereof.

Ans. While in France I did, but not in the other countries men-

tioned. I was well acquainted with Mr. Goodyear while in
43 Paris, who was an inventor of shoe-making machinery and had it at work there, and I went frequently to his place of business, where he had his own machinery as well as other kinds for sale, and I used frequently to witness the operations of the various machines. I think that upon one occasion I was taken to see the Government shoe machinery at work in making shoes for the Army.

Cross-int. 25. Within what dates did you visit Mr. Goodyear's place, as stated?

Ans. I don't remember when my visits commenced. I had known him for several years, but the visits ended in the autumn of 1879.

Cross-int. 26. Did Mr. Goodyear, to your recollection, have any rotary edge-trimming machines at the times you speak of? And, if so, please describe the kind of cutters that were employed thereon.

Ans. I cannot say whether he did or did not. I have no very distinct recollection upon the subject. I went to see certain special machines to which he called my attention, and witnessed other operations only incidentally, with which I did not attempt to charge my mind.

Cross-int. 27. You have testified in relation to being "obliged to carefully study many patents in connection with the sale of patents which was entrusted to your charge" while in Europe. Please state if any of these related to the art of trimming shoe soles by machinery; and, if so, please designate what patents they were.

Ans. None of them were connected with the art of trimming shoe soles, but related to other subjects.

Cross-int. 28. After your return from your seven years' stay in Europe and during the period of your subsequent trip to and stop there in connection with patents, machinery, and the manufacture of horseshoes and horseshoe nails did you have occasion to or did you devote any time or study to the art of manufacturing boots or shoes by machinery? If so, please state the extent thereof.

Ans. I did. I made my headquarters in London, in an establishment where there was a large collection of shoe-making machinery, of both English and American make, and where the machinery was operated. During the principal part of two years I was in this establishment several times a week. I also visited the large establish-
ment of Greenwood & Batley, at Leeds, where I saw many
44 shoe machines, completed and in process of construction, and where the machines were also operated.

Cross-int. 29. Please state within what dates this stay in England is included.

Ans. From 1880 to August of 1882.

Cross-int. 30. While visiting the establishments referred to in your preceding answer did you observe any machines intended for and adapted to the trimming of edges of shoe soles; and, if so, what kind of cutters were employed therewith or embodied therein?

Ans. I do not remember definitely whether there were or not. I had only a general interest in the subject, and, while I remember that there were a great variety of appliances shown to me at various

times for making shoes and which excited a passing interest at the time, I have no means of recalling them in detail at this moment. The only machinery pertaining to the art of which I have a general recollection were the large and prominent machines which contained mechanical movements, which specially interested me as an engineer.

(Noon recess.)

Cross-int. 31. As a conclusion to your answer to Int. 2 you stated that since your return to America you have been engaged in constructing machinery and as consulting engineer for manufacturing companies, and have acted at various times as expert in patent cases dating back to 1873. Please state, first, the nature, kind, or use of machinery there referred to as having been manufactured by you, and, second, the classes or kinds about which you have been consulted as engineer.

Ans. I have constructed machinery for making horse nails, making dies, machinery for grinding metal, and I have acted as consulting engineer for parties in Massachusetts, Rhode Island, and New York in matters pertaining to silver-ware manufacture, cotton manufacture, printing, railroads, steam appliances, and other general matters, and, of course, shoe machinery in this case.

Cross-int. 32. Have you at any time previous to this case acted as an expert in any patent cases the subject-matter in controversy in which was shoe machinery of any kind? And, if so, please designate the cases and the dates when you were so employed.

Ans. I have never acted as expert in such cases before.

45 Cross-int. 33. Have you ever been concerned in designing, preparing drawings for, manufacturing, selling, putting in operation, or running any boot or shoe manufacturing machines?

Ans. Never; I have only witnessed their running by others.

Cross-int. 34. Have you heretofore witnessed the operation of trimming boot or shoe sole edges by means of a power-driven rotary cutter? If so, please state when, first, and where.

Ans. That I cannot say. In various factories and at the various places that I visited where shoe machinery was running I saw whatever was employed in shoe-making from the first stages of making the shoe to the last operation for its completion. What the means used were for trimming the sole I do not now remember.

Cross-int. 35. Can you state positively that you have ever witnessed the operation of trimming boot or shoe sole edges by means of a rotary cutter? And, if yea, please state when and where.

Ans. I can. I witnessed the operation of trimming sole edges by rotary trimmers at an establishment in Boston, situated somewhere toward South Boston. I visited this establishment in December, 1883, but I do not even remember the name of the street where the establishment was situated. I only know that it was on a street going to South Boston.

Cross-int. 36. Did you visit that establishment with reference to testifying as an expert in this case?.

Ans. I did. I visited it in company with Mr. Noble and Mr.

Maynadier in order to see the machine operate which was involved in this suit. I desire to change the date 1883 in my answer to the previous question to 1884.

Cross-int. 37. Had you at any time before or have you at any time since the above-stated visit witnessed the operation of trimming boot or shoe edges with rotary trimmers where you had any special occasion or interest to examine the operation of such cutters or the method of performing the work?

Ans. No; I have not. The principles there exhibited were so like those with which I was familiar before in cutting soft and hard material that I deemed a repetition of examination unnecessary.

Cross-int. 38. What kind or class of shoes did you see trimmed at the shoe shop which you visited as you stated?

46 Ans. I am not sufficiently familiar with the technical terms of the various classes of shoes to say that they were anything more than what used to be known as brogans—that is, they were shoes intended to go somewhat above the ankle.

Cross-int. 39. Were they double or single sole?

Ans. I think they were double sole—in fact, I know they were double sole.

Cross-int. 40. Upon what portions of the sole—that is, what number of the fundamental parts of the sole upon which a cutter may operate, as heretofore stated by you in direct examination—were these cutters operating at the time you saw them?

Ans. My recollection is that it was upon three.

Cross-int. 41. Can you state whether those cutters, as you saw them operate, were cutting out the entire rand or not?

Ans. They were not cutting out the entire rand. The operator used another (a hand) implement for cutting out a portion of the rand and afterwards used the rotary tool to finish.

Cross-int. 42. Have you been familiar with the introduction of the Brown & Sharpe cutter, so called, made under the patent of J. R. Brown of 1864, and the development of its use in the various metal-working arts, and more especially during the last half of the life of that patent?

Ans. I have.

Cross-int. 43. Please state in your own way and as you would judge might best give the court an idea of the extent of the use of cutters embodying the essential features of that patent to what extent such cutters have been employed in this country and the various arts in which they have been employed.

Ans. The Brown & Sharpe cutters for cutting gears are generally known in the leading establishments using gear-cutters throughout this country and Europe, and the cutters have been in use to a very large extent.

Up to the time of the Turkish contract for arms by the Providence Tool Co. no other form of that cutter had been known. Somewhere about 1875 or 1876 other forms were given to those cutters for cutting metals. That idea spread to a very large extent in this country,

47 and Brown & Sharpe furnished a great number of cutters to manufacturers in this country during the life of their patent.

Such cutters have become somewhat known in Europe, but, so far as my observation extends, had not there been generally adopted up to the time when I left, in 1882. The circulars and the cuts of the tools, however, were widely spread in Europe.

Cross-int. 44. In your opinion, based upon your knowledge and observation, in how many differently formed or kinds of cutters has the essential features of the Brown patent been embodied up to the present time? Please — your best judgment on that point.

Ans. I can only give a very general answer to that. I may have seen forty or fifty forms, more or less, myself. I should judge, however, that previous to 1881, the expiration of the patent, during which time Brown & Sharpe manufactured all the cutters under that principle, that while the number of cutters might have been very great which they manufactured, the number of forms which they made were comparatively limited, owing to the very high price they charged over ordinary milling-cutters. Since the expiration of that patent, however, when any shop in the country has the right to make its own cutters, I have no doubt that the number of forms has been very greatly multiplied.

Cross-int. 45. Have you been at any time within the last five or six years familiar with the number and forms of cutters embodying the Brown idea which were being or now are employed in Colt's armory at Hartford or at the Winchester Arms Co.?

Ans. No; I have not been familiar with the operations at those establishments for a number of years.

Cross-int. 46. How many different kinds—that is, forms—of rotary milling-cutters would, in your judgment, be required to make any one pattern or size of pistol or any pattern of gun?

Ans. In order to answer that question properly I should be obliged to have the specimen pistol or gun before me, either in drawings or model. I should be obliged to have the number of parts to be milled clearly indicated in order to tell how many milling-cutters would be required. I can only say in general that if the number of pieces of metal composing the gun or pistol were given and their forms shown the number of cutters that could be
applied to those pieces would depend entirely upon the char-
48 acter of forms upon the pieces. A given piece of a certain gun, for instance, might require three cutters or it might require three times three cutters. To answer such a question as that definitely or even approximately would require the engineer of a gun establishment to make a special study of the special gun or pistol desired of at least several days and an accurate study of a much longer time. If there were one hundred parts in the gun and there were two different forms to be milled upon each piece there would require to be two mills for each piece, and, consequently, for the one hundred parts there would be two hundred mills. If there were three special forms upon each piece three hundred mills would be required, and so on. The whole matter would depend upon what kind of a gun or a pistol you were making. It is safe to say that where there is a special form there would be a special mill.

Cross-int. 47. Can you not, from your experience in gun-making and gun-making machinery, give a more definite answer than the last with reference to the probable or approximate number of kinds of milling tools or cutters which would usually be required in the making of a gun or pistol of any specific size or kind? If you can, please do so.

Ans. I cannot give a more definite answer, nor can it be given by the superintendent of any gun factory in the world, unless he has a remarkable mind for statistics. Unless a man had drilled himself to carry in his head the innumerable details of the operations upon so intricate a mechanism as a gun or a pistol he could not, without special preparation, answer that question more definitely than I have done. It is as difficult a task as it would be to ask the city engineer of Boston how many screw-drivers, monkey-wrenches, and other small tools there are in the mechanical department under his control. It could be done, but he would have to refer to his books or count them up before he could answer the question.

Cross-int. 48. Please state whether, in your judgment, based on your experience, it would require more or less than one hundred cutters to make an average ordinary or usual gun or pistol of any given size or pattern.

Ans. I should think it would take a great many more than one hundred cutters.

(Adjourned.)

49 BOSTON, *Jan.* 22, 1885.

(Counsel present as before.)

Cross-int. 49. Please state whether or not there is any form produced or milled by milling-cutters which may not be produced by cutters made in accordance with the principles of the Brown cutter.

Ans. I do not think of any that cannot.

Cross-int. 50. Please examine the following-named exhibits, marked as exhibits in the suit of Busell Trimmer Co. *et al. v.* Corthell Manufacturing Co. *et al.* and now introduced and marked with the title of this case—Complainants' Exhibits Brown & Sharpe Milling Cutters 1 and 2, Defendants' Exhibits Colt's Armory Cutter, and Colt's Armory Cutter No. 4; also Complainants' Exhibit Milling Cutter—and state whether or not, in your opinion, they were intended and are adapted to be used in milling metals, such as gun work or the like.

Ans. I have examined the exhibits and they appear to be all intended for cutting metals. Two of the cutters, however, marked "Colt's armory cutters," are carried to extreme limits. One of them with extreme care, by feeding the metal very delicately against it, may possibly be practically used as a metal-cutter for hard metal, but as five teeth out of twelve are broken and seven out of twelve in the other case are broken, apparently in using them it resembles more a mechanical feat to use such a cutter than anything else. The broken teeth are the best evidence of this fact.

Cross-int. 51. Please state whether these several cutters embody the essential features of the Exhibit Brown Patent.

Ans. They exhibit the front flat face to be ground and the molded face not to be ground, which I understand to be the essential features of that patent.

Cross-int. 52. Please state whether, in your opinion, it would be practical to trim a shoe-sole edge with either of said cutters, employing therewith a rand guide.

Ans. It would not be practical to trim shoe-sole edges in a mercantile sense with either of the cutters exhibited—that is, what I term as the mercantile sense to trim the rand, bed, and guard of shoe soles as the trade require them to be trimmed.

Cross-int. 53. Are you able to state of your own knowledge
50 or experience whether the trade requires in all classes of shoes that the rand, bed, and guard be trimmed as stated in your preceding answer?

Ans. From what I know of the manner in which a shoe is made I know that the rand of a shoe must be trimmed, the bed of a shoe must be trimmed, and the guard of a shoe must be trimmed, meaning when I speak of these operations always first-class shoes, which are completely and handsomely finished.

Cross-int. 54. Suppose it was desired to trim shoe soles with a form of edge or edges of a style or form which either or any of said cutters are adapted to give, would it, in your opinion, be practical to trim a shoe-sole edge with either or any of said cutters. And, if yea, please designate which.

Ans. It would not be practical to trim a shoe sole edge with either of these metal-cutters when used as they were intended to be used when made as metal-cutters in the organizations intended for those cutters. They would not cut leather and I doubt if they would scarcely scrape it, although two of them might in an imperfect manner.

Cross-int. 55. Please explain as briefly as you can what you intend to have understood or what you understand by the words in your last answer, "when used as they were intended to be used when made as metal-cutters in the organizations intended for those cutters."

Ans. Metal-cutters are intended to be used in a machine powerfully geared to revolve those cutters at a slow and powerful surface speed against the metal to be cut. As previously stated in my testimony, the surface speed would be somewhere in the neighborhood of twenty feet per minute, more or less, which, in my judgment, is a speed so slow that it would not properly trim leather.

Cross-int. 56. Please to re-read cross-int. 54 and state whether, in your opinion, it raises or involves any question in relation to how these exhibit cutters were intended to be used or might be used in milling metal, or whether it merely involves a question of the capacity of these cutters when applied in a well-known way to trimming sole edges.

Ans. To my mind it does involve the question as to how these cutters should be used. You have presented metal-cutters to me

with the principles of which I am familiar. You do not stipulate by your question any different means of operating them from
51 those which were intended to operate them, and I have confined my answer within those limits.

Cross-int. 57. The question involved in cross-int. 54 is this, and it is now repeated: Is it practical, in your opinion, to trim shoe-sole edges with any of these exhibit cutters; and, if so, which? And in answering this question, in order to save time, please not to suppose, as you have heretofore done, that any operator in sole-trimming would be so stupid as to use these cutters for that purpose in an iron milling machine, but that he would make use of the cutter in well-known machines for that purpose having the required rotary velocity and not the slow speed of metal-working tools (the cutters referred to being those enumerated in cross-int. 50).

Ans. With the explanation given in the last question and referring to question 54, where it says, "Suppose it were desired to trim shoe soles with the form of edge or edges of a style or form which either or any of said cutters are adapted to give," I should say that these cutters might trim a leather-sole edge, but it would not be trimmed in a practical or mercantile sense, but merely a mechanical feat.

Cross-int. 58. Please state what you mean by the words in the last answer, "in a practical or mercantile sense."

Ans. There is a certain relation of parts to each other which must be preserved in order to produce smooth, merchantable cutting. The distance of the cutting teeth from each other, the angles of the flat front faces and of the top or molded faces must have a certain relation to each other, so that the top or molded surface of the teeth will act as guards to prevent the tool from unevenly cutting the sole; — are important factors in a leather-trimming tool which must be absolutely taken into account, and these features, as far as they appear to the eye, are different upon the metal-cutting tools from those shown on the Complainants' Exhibit Busell Cutter (Orcutt patent of '81).

Cross-int. 59. In your last answer you have described the essential features requisite in a cutter in order that it may trim a sole in a practical, workmanlike manner. The question called for nothing of the kind, as you will perceive on reading your answer to cross-int. 57 and cross-int. 58; but it did call for an explanation of what you regarded as involved in a sole trimmed in a "practical
52 and commercial" manner. Will you please now state what you regard as a sole trimmed in a "practical and commercial" manner?

Ans. I mean a sole trimmed in a smooth and finished manner, without roughness or corrugations; such a finish, in fact, as one sees in all first-class shoes.

Cross-int. 60. Then, in brief, you do not believe that any of the exhibit cutters specified in cross-int. 50 would trim a sole "without roughness or corrugations?" Is this so?

Ans. I do not believe that they would trim soles in a first-class, mercantile manner except by the employment of extreme, unusual

care—that is, more than the usual skill necessary to properly do shoe-sole trimming. I should admit the possibility as a mechanical feat of trimming a sole with these cutters just as I should admit the possibility of trimming the sole with an emery wheel or anything else that was used to cut away materials and revolving at a high velocity.

Cross-int. 61. Please return to cross-int. 60 and answer the question therein involved, to wit, whether shoe-sole edges could be trimmed with either of exhibit cutters named in cross-int. 50 without roughness or corrugations.

Ans. Possibly shoe soles could be trimmed without roughness or corrugations by either or all of these cutters if unusual care and skill were exercised.

Cross-int. 62. In your answer to cross 58 you spoke of the "relations of the parts to each other that must be preserved in order to produce smooth, merchantable cutting," and as among these you instance the "distance of the cutting teeth from each other, the angles of the flat front faces and of the top or molded faces must have a certain relation to each other." Please examine the three cutters now shown you, marked Defendants' Exhibit Worn Cutters, W. A. C., sp'l ex'r, in connection with Complainants' Exhibit Busell Cutter (Orcutt patent of '81), and state whether or not, as a matter of fact, those relations do not change with the wearing away of the cutter teeth by grinding, or whether or not the distance between the teeth is increased with every grinding.

(The cutters are now put in evidence and maked Defendants' Exhibit Worn Cutters, W. A. C., sp'l ex'r.)

53 Ans. I have examined the cutters marked Defendants' Exhibit Worn Cutters. The distance from the front flat face of one blade to the front flat face of the succeeding blade is substantially the same in the worn cutters as the distance from the front flat face of the blade in the new cutter is to the front flat face of the succeeding blade of that cutter; therefore the distance between the cutting edges of each blade in both the old and the new cutters is substantially the same. I say substantially the same, meaning that there may be trivial differences produced by carelessness in grinding the old cutters. Of course, the angles produced by the front flat face and the molded face are not supposed to be touched, but to remain as when first made.

(Noon recess.)

Cross-int. 63. Do you not perceive upon hearing the preceding question and answer read that you either evade or avoid the material point of the question, which is whether or not the distance between the teeth is increased with every grinding and not whether the front faces of the teeth maintain their relative distances apart? Will you please state whether or not the space between the teeth is increased with every grinding?

Ans. Yes; the space between the teeth is increased. What I meant to state before was, as I understood the question, that the re-

lation of the cutting part of the teeth to each other was the same as when new. As you grind away the face of one tooth of course it thins the tooth, and consequently leaves more space between its front and the back of the preceding tooth.

Cross-int. 64. If, as you stated in your direct examination, the peripheral face of each tooth acts as guard for the preceding one and, as you now state in substance, such guard or outer face is reduced at every grinding, does it not follow that when the teeth are ground away to the extent shown in said worn cutters that the relation of the guard to the other parts has been materially changed?

Ans. No; I do not think it has been materially changed in effect. At the lightning-like velocity at which the cutters are run there is but a very small portion of the top of the tooth which is necessary to act as a guard after a blade has cut before the next blade gets around, and as long as enough of the tooth is left to stand up there is guard enough left to perform its proper function.

Cross-int. 65. Do you think that each of the three of said
54 Exhibit Worn Cutters is susceptible of triming a sole edge in practical mercantile shape or not?

Ans. I should think very likely they might, but I should want to try them before expressing an absolute opinion.

Cross-int. 66. Can you not give an opinion from an inspection of them?

Ans. I have already expressed an opinion; I can give no other.

Cross-int. 67. Are you unable, from your knowledge of this art, to state positively whether or not good, practical trimming can be done with these cutters?

Ans. I see nothing about the cutters that would lead me to believe that they would not trim a shoe sole very well, but I am not in the habit, as a mechanic, of saying absolutely that a tool will work well without trying it, or at least of ascertaining if it is in perfect condition. These tools may or may not be in perfect condition. They are just brought into the case, and there has been no opportunity to make an examination other than by the eye. As far as I can judge by the eye, I see no special reason why they might not do good work.

Cross-int. 68. Do you deem it a proper position of an expert testifying in any patent suit to decline giving a positive opinion in relation to the capacity of the very tool the patent upon which constitutes the basis of the suit, or do you wish to be understood that you are not sufficiently familiar with this art to state positively whether the Exhibit Defendants' Worn Cutters are or not capable of performing good work?

Ans. I deem it my duty as an expert to deal as accurately as I can with the principles pertaining to the structures which are in controversy. I do not deem it my duty as an expert to undertake to judge accurately as to whether certain tools presented, and which I have had no opportunity to measure or test in any proper way, will do proper work upon a shoe sole. I don't even know whether these tools are tempered or untempered, or are even of the proper quality of steel, or whether their angles are properly made or not. In fact,

I don't know anything about these particular tools except what the eye teaches me; but, assuming that these tools are made according to the principles that are indicated by Orcutt's patent and are in respect to material and other matters correct, I should say
55 that they might, and probably would, properly trim a sole. I will not attempt to be absolutely accurate about a piece of mechanism that I have never seen before without the ordinary mechanical appliances for determining accuracy.

Cross-int. 69. In your last answer you speak of assuming that the Exhibit Defendants' Worn Cutters" are made according to the principles that are indicated by Orcutt's patent. Can you not state positively whether said cutters are made in accordance with the principles of Orcutt's patent by a mere visual inspection thereof?

Ans. Substantially they are.

Cross-int. 70. Do you think that cutters ground away to the extent of these Exhibit Worn Cutters are not as capable of performing good work as are cutters like those shown in Complainants' Exhibit Busell Cutter (Orcutt patent of '81); and, if not, is it due to the grinding away of the teeth upon the front face—that is, reducing the thickness of the teeth?

Ans. I should think that where heavy trimming is to be done upon the sole a new cutter might cut a little more advantageously than a cutter ground so thin that the teeth might have a tendency to spring, but upon very light trimming the difference in trimming might be very slight, if any at all.

Cross-int. 71. Take a cutter like the Exhibit Busell Cutter (Orcutt patent of '81) in the condition shown in that exhibit and continue using the same and grinding it away as its sharpening required, would there be, in your opinion, any reduction or decrease in its working efficiency up to the time when it was worn away to the extent shown in Defendants' Exhibit Worn Cutters?

Ans. I should think not any substantial decrease.

Cross-int. 72. Do you think the cutter now shown you, marked Complainants' Exhibit Brown Patent Gear Cutter, in the suit of Busell Trimmer Co. *et al. v.* Corthell M'f'g Co. *et al.*, and re-marked with the title of this suit, is made in accordance with the invention described and claimed in the Brown patent of 1864, to which reference has been made?

Ans. I do.

Cross-int. 73. Do you think this cutter is capable of trimming a shoe-sole edge in a practical and mercantile manner, provided its form of face was such as a shoe manufacturer desired?

Ans. No; I do not, except as a mechanical feat requiring
56 unusual care and skill entirely beyond anything now required by practical shoe-trimmers.

Cross-int. 74. What features or constructive elements does it lack or what inherent features does it possess which would prevent its trimming leather, according to its form, with the same facility and degree of finish as would either of the exhibit cutters now introduced in this case or any cutter made in accordance with the Orcutt

patent of '81? Please state fully and clearly the reasons which you may give.

Ans. I should think the teeth did not occupy the right relation to each other. They are too far apart, and the angle formed by the flat front face and the top molded face is not such as a proper leather-trimming-tool tooth requires. The cutter, by the wide spreading apart of its teeth from each other, would be too rank to evenly trim the sole, and the peculiar angle formed by the flat front face and the top face of the teeth I do not think to be adapted to cut so much as scrape the leather, and this might produce undue heating of the tool, as well as a part of the unevenness referred to.

Cross-int. 75. From what experience of your own or what facts within your own knowledge do you draw the foregoing conclusions? In answering this please state how many kinds of cutters you have seen used upon shoe soles in trimming them and the length of time in all, as near as you can state, that you have witnessed the operation of trimming shoe soles by rotary cutters.

Ans. From my experience and that of others whom I have observed in turning leather in a lathe—for instance, in turning leather upon the face of a pulley, where the leather is revolved against the tool instead of the tool revolved against the leather, as in this case—I judge it to be one of the most difficult things to make a tool with the paper form and angles to cut leather revolving as described. I have seen it repeatedly tried by experienced men, and I know that it requires men of the best skill and judgment to make a tool that will successfully perform that work. I have seen workmen who were well skilled in making tools for turning steel or iron experience great trouble and oftentimes failure in attempting to do that sort of work. Tools that will readily cut wood and cut iron in machines will not cut leather with equal success. As for the number
57 of shoe-trimming tools that I have seen in operation or of the length of time that I have seen them operate I can give no adequate idea, as I have already stated in my testimony; but I have seen burr tools used more or less all my life in cutting various substances in machine shops and elsewhere, and sometimes used in trimming leather, but, as they did not specially interest me, I have never made any special note of the number or times that I have seen them.

Cross-int. 76. Have you seen shoe-sole edges being trimmed with rotary cutters at more than one time?

Ans. I have already testified upon that point, and I can only repeat that I do not remember at this time definitely any rotary cutters in operation other than those that I saw in December.

(Adjourned.)

BOSTON, *Jan.* 23, 1885.

(Counsel present as before.)

Cross-int. 77. Please examine the shoes now shown you respectively marked as follows: Defendants' Exhibit Corthell Shoe No. 1, round rdge; Defendants' Exhibit Corthell Shoe No. 2, half round edge; Defendants' Exhibit Corthell Shoe No. 3, half round edge;

Defendants' Exhibit Corthell Shoe No. 5, half round edge; Defendants' Exhibit Corthell Shoe No. 6 (the above-mentioned shoes are marked as exhibits in the suit against Corthell Man'f'g Co., and now put in evidence and re-marked with the title of this suit), and state whether or not they represent a style or form of edge known and recognized by the trade and the quality or grade of the work performed in trimming the edges—that is, is it well done, poorly done, or what is the quality of the work, leaving out in this part of the question, the form or contour of the edge?

Ans. I do not know whether or not it is a form recognized by the trade; I am not a shoe-dealer. Whether the form is a desirable one or not, the work is the poorest I have ever seen upon a shoe-sole edge. Upon the edges of four of them (Nos. 1, 2, 3, and 5) there is a burnished appearance in places that looks as though it was caused by the burnishing of a dull tool or an improperly made tool, and upon the bottoms of the soles of No. 3 and 5 there are gashes and channels cut which are improper upon a first-class sole, and appear to have been made by a tool that was improperly constructed for the work.

58 Upon Exhibit No. 1 the work upon the edge of the sole is rough and uneven and of the most inferior quality, besides presenting the burnished appearance which no properly constructed tool should have made.

In Exhibit Shoe No. 6 the bottom of the sole has improper tool marks left upon it, but the edges of the soles have the appearance of having been burnished after the cutting and then blacked, and the edge is about such as one would find upon a coarse, inferior shoe.

Cross-int. 78. In giving your preceding answer have you taken into consideration the fact that the several exhibit shoes, as is evident from their appearance, have, since their edges were trimmed, been subjected to rough usage and handling, and do you judge from a casual inspection or from a careful inspection of the sole edges and the execution of the work thereon in trimming them?

Ans. I have examined them carefully and have taken into consideration their handling, and I believe the appearances that I have described to be due to the method of trimming them and to the character of the tools used therefor. The work appears to me to have been done by tools not originally intended to be used upon them; consequently the work is inferior.

Cross-int. 79. In your opinion, were these shoes or any of them trimmed by any of the cutters which have been introduced in evidence since you have been testifying? And, if so, please indicate the cutters with which said soles were respectively trimmed.

Ans. I cannot tell whether they were done by either of the exhibit cutters or not, but by comparing their edges with Defendants' Exhibit Colt's Armory Cutter No. 4 it would appear as though Exhibit Corthell Shoe No. 2, half round edge; Exhibit Corthell Shoe No. 3, half round edge, and Exhibit Corthell Shoe No. 5, half round edge, have been cut with one half of Defendants' Exhibit Colt's Armory Cutter No. 4, and that Defendants' Exhibit Corthell Shoe No. 1, round edge, had been cut by using, first, half of De-

fendants' Exhibit Colt's Armory Cutter No. 4 to cut the upper corner of the sole, and then the other half of the cutter had been used to cut the lower corner of the shoe sole; but I do not think that the cutters were used in conjunction to trim the shoes 2, 3, and 5
59 as the complete cutter, when the halves are put together, would have cut the upper leather, because it is wider than the thickness of the soles.

Cross-int. 80. Do you think it would be practical to trim either of these soles, or that either of them was trimmed with Complainants' Exhibit Brown Patent Gear Cutter?

Ans. Not in the organization in which it was intended to be placed when made, and in that organization could not cut them at all. If you mean were that cutter placed in an entirely different organization, such as is used in shoe-trimming, it might be possible to indifferently cut the shoes 2, 3, and 5 by the exercise of unusual care and skill as a mechanical feat, but it could not cut in any proper sense nor in any way that is usual in the trade the shoe No. 1. It would be barely possible as a mechanical feat and not otherwise.

Cross-int. 81. Why, in your last answer, do you encumber it with the matter of the "organization in which Exhibit Brown Cutter was intended to be placed when made?" Has the intention of the maker of that cutter anything to do with the capacity inquired of in the preceding answer? When a tool is made and legitimately put upon the market is it not presumable that its capacity for use is the proper measure to judge it by rather than the supposed intention of the maker, and do you deem it a proper method of testifying when inquired of in relation to the capacity of a tool to perform a definite object to endeavor to qualify, color, or give effect to your answer by assuming the intention of the maker of the tool, when the only question is, What can be done with the tool in a specific case?

Ans. When a gear-cutter is legitimately made and placed upon the market and stamped by the maker with the signs which indicate its legitimate purpose as a gear-cutter, and I am asked if that cutter will cut a shoe, I have a right to answer that if it is legitimately used as the maker intended, as shown by his stamp, it will not in any sense trim a shoe; and I merely assumed, for the sake of saving time, that if it was illegitimately used it might possibly cut a shoe in an indifferent manner.

That is why I answered that question as I did.

Cross-int. 82. You have not answered the essential matter of the preceding question, and in order that you may have an opportunity to do so it is now repeated in substance as follows: When you
60 are asked whether a given cutter will perform a specified job or object, do you believe that the intended use of that cutter by the builder has anything to do with the capacity of the tool to perform the job or work inquired of? Please answer yes or no, or as nearly so as you can.

Ans. I think the intention of the builder had everything to do with it. The intention of the builder in this case is evident, which was to properly cut metal, and the tool will do it; but his intention

was not to make a tool which will properly trim a leather sole, for it won't do it.

Cross-int. 83. If you was shown the sworn testimony of those skilled in the shoe trade as trimmers and manufacturers taken in the suit in which these cutters were first introduced, stating in substance that these shoe-sole edges were well trimmed, the work performed thereon by the rotary cutters was well done, would it change your opinion in the least in relation to the quality of the work or your confidence in the opinion which you have expressed in relation thereto?

Ans. Not in the least; I shouldn't believe it. If they said that those shoes were left in a merchantable condition by whatever cutter operated upon them in the case of No. 2 and No. 5, and that the cutter or cutters that were used would produce merchantable work in daily use with only the amount of skill employed required by legitimate shoe-trimmers, I should disbelieve it.

(Counsel moves to strike out all after "No. 5" as not responsive.)

Cross-int. 84. Your answer seems to refer only to No. 2 and No. 5, as qualified after giving it. How about Nos. 1, 3, and 6?

Ans. Nos. 1 and 3 are better specimens, but No. 1 is more roughly trimmed than any specimen of first-class work that I have seen done in a legitimate manner, and both No. 1 and No. 3 have the evidences of burnishing in places which I deem to have been produced by an improper tool. The edge of No. 6 has evidently been subjected to another process than trimming and is blacked; but the sole upon its lower surface, near the edge, has improper tool marks upon it which first-class trimming should not produce and leave upon a finished shoe.

Cross-int. 85. You misapprehended the last question. In
61 cross-int. 83 you were asked what would be the effect, if any, of certain testimony upon your mind as to the quality of work upon the sole edges of these five exhibit shoes. In your answer thereto you confined your answer to Nos. 2 and 5. Please now state whether such testimony would affect your testimony as first given in regard to Nos. 1, 3, and 6; and, if so, in what way and to what extent.

Ans. No; it would not.

Cross-int. 86. You have spoken of marks upon the bottom of the sole of some of the exhibit shoes as having been caused by the trimming cutter. Do you regard them as serious defects or as defects not usually occurring in the use of any and all rotary trimmers?

Ans. In the case of No. 2 and No. 5 they are so deep that I should regard them as serious defects upon a first-class shoe, but in the other cases I should not regard them as serious, because they could be removed by the ordinary means without seriously affecting the shoe.

Cross-int. 87. Please state fully and as clearly and concisely as you can what you understand to be the subject-matter of the Orcutt patent, No. 238,303, involved in this suit, stating definitely each and all of the essential features thereof, as you understand them.

Ans. It consists in the arrangement of a series of cutting blades about a common hub, and each blade has a flat front face and a molded or fancy top surface the converse of the sole edge, and having the ridge marked 1 in the drawing, namely, a rand-cutter, a bed-cutter, the guard-cutter, and these forms, with their subdivisions, such as a bead and channel cutter, marked 2 in the drawing, extending across the top surface—that is, from front to back—and this top surface with these forms is made eccentrically to the axis of the complete cutter. The flat front faces of each of the blades are arranged to be ground without disturbing the molded form of the outer or peripheral edges of the blades, and this complete rotary cutter is adapted to be operated with a rotary rand guide. It is a cutter, in its complete state, which may trim the three fundamental forms required by the edge of a first-class shoe sole, namely, the rand, the bed, and the guard, with their subdivisions. It is a cutter which may have all the complicated forms desired for all classes of shoes upon each blade, and the blades may be instantly sharp-
62 ened without disintegrating the cutter or without drawing its temper, and may continue to be sharpened, without disturbing the relations of the complicated top surface forms, until the cutter is worn out.

(Noon recess.)

In the Orcutt cutter blade the front flat face rakes forward, so to speak. In other words, the cutting edge of the tooth projects forward of a radial line which would touch the base of the face of the tooth, while in a metal-cutter the front flat face of the tooth would have its cutting edge back of a radial line touching the base of the tooth. A leather-cutting tooth rakes forward, and a metal-cutter rakes backwards, more like a scraper.

Cross-int. 88. In giving your last answer and in speaking of Orcutt's cutter as being adapted to trim the rand, bed, and the guard at the same operation, do you understand and make that answer with the understanding that Orcutt was the first to provide a tool that would trim those three subdivisions at one and the same operation?

Ans. I understand him to be the first to perform those operations with a tool such as is described in his patent. In my previous testimony mention is made of tools differently organized which could make those cuts in a certain manner.

Cross-int. 89. Your answer does not reply to the question. Will you state whether or not, in your previous testimony, you intended and desired to be understood that in your belief Orcutt was or was not the first to provide a tool that would trim the rand, the bed, and the guard at one and the same operation?

Ans. I do not intend to be so understood, and have said so.

Cross-int. 90. You have spoken, in answer to cross-int. 87, that Orcutt's cutter is adapted to be operated with a rotary rand guide. Do you regard that as a new feature in the Orcutt cutter, or was it common and known in cutters the patents for which antedate

Orcutt's patent and to which you have referred in your examination-in-chief?

Ans. No; the idea of using a rand guide with a sole-trimmer was common before Orcutt's time.

Cross-int. 91. Is there anything shown in Orcutt's patent that you find, or anything in his cutter, in fact, which requires any peculiar arrangement or any different application of the rand guide
63 with the cutter than is shown in other and earlier patents to which you referred in your examination-in-chief?

Ans. The peculiarity in his case was in adapting a rand guide to be used with a shoe-trimmer such as had never been seen before, which possessed blades upon the outer edges of each of which might be placed all the forms which might be required upon a first-class shoe sole, and these blades having front flat faces to be ground so as to leave these peripheral forms intact until the blades were used up.

Cross-int. 92. Will you please re-read carefully the last question and note that it does not refer to matters embraced in your answer, but that it asks whether it requires "any peculiar arrangement or different application of the rand guide with the cutter than is shown in other and earlier patents to which you referred in your examination-in-chief." If you think this question requires an exposition of the facility for sharpening the Orcutt cutter or the preservation of the peripheral face, please say so; otherwise please state, as the question asks, whether the Orcutt cutter does or does not require any peculiar arrangement or different application of the rand guide with the cutter than is shown in other and earlier patents to which you referred in your examination-in-chief, as already stated in the question.

Ans. No; once the Orcutt cutter was conceived, I do not think that there was any different application of rand guide from that previously shown.

Cross-int. 93. In your answer to cross-int. 87 you instance as one of the distinguishing features of Orcutt's invention the overhang or rake of the teeth of his cutter. Please state, first, whether, in view of the state of the art at the date of his invention, the overhang or rake of the front line of the teeth in a rotary cutter would constitute an actual element of invention; and, second, whether you regard Orcutt as the first to employ raking or overhung teeth in a rotary cutter for trimming shoe soles. Please answer these two propositions separately and as distinctly as you can.

Ans. I spoke of the overhang of the teeth in the Orcutt patent as one of the features which I found in combination with the other features of his patent in answer to the question as to what was the subject-matter of his patent. I believe it to have been new to use a projecting face with a cutter having a molded top face on its
64 teeth which was not designed to be disturbed in grinding, and that element in connection with the other mentioned seems to me to be a fair component in the invention. I do not consider Orcutt to be the first to have employed raking teeth *per se*, as

that is shown in combination with divers features of other kinds of cutters.

Cross-int. 94. Then if you "believe it to have been new to use a projecting face with a cutter having a molded top face on its teeth which was not designed to be disturbed in grinding, and that element in connection with the others mentioned seems to me (you) to be a fair component in the (Orcutt) invention," you must believe that after Brown had taken out his exhibit patent on cutters in 1864, which showed a retreating or backwardly inclined front face to the teeth, that another person who first made that kind of a cutter with raking or overhung teeth could have obtained a valid patent for such change cutter. Is this so or not?

Ans. No; I do not—that is, not for metal-cutters designed to be used with the organization for which those cutters were intended to be used. Brown established the general principle and form proper be used on metal-cutters, in the manner that they were intended to be used, and any slight deviation from the general form that he established would be obvious to the commonest mind in the metal art, and therefore would not be invention.

Cross-int. 95. Do you think the change from a retiring to an overhung tooth might, as indicated in your preceding answer, be patentable or constitute a patentable feature in a cutter for trimming shoe soles, when it would not be in a cutter intended for milling metal?

Ans. I fear that question asks me, as an expert in mechanics, to trench upon the functions of the judge, and I prefer not to give an opinion.

Cross-int. 96. Do you refuse to answer the question?

(Question objected to as being a question of law, but the witness is told by complainants' counsel that inasmuch as the defendants' counsel desires his opinion on a question of law, there is no harm in giving it.)

Ans. I do, because, as it seems to me, a question of law and I am not an expert in law I do not care to answer the question.

Cross-int. 97. Please state whether or not, in your opinion,
65 the last question propounded, which you declined to answer, involves a question of law in any sense more than is involved in question No. 7 in direct examination. Please read that interrogatory before answering this question, and if you can distinguish between the two questions as to involving a question of law please do so.

Ans. Int. 7 asked me whether a thing is an invention or not. Cross-int. 95, if I rightly understand it, asks me if a thing is patentable or not. The law establishes what is patentable, as I understand it, but any man may have his own opinion as to whether he thinks a thing is an invention or not. This may be good or bad law. I cannot say which, for I am not a lawyer.

Cross-int. 98. Then, if you think there is a distinction between an invention and what is patentable, cross-int. 95 is repeated in substance, but in this form: Do you think the change from a retiring

to an overhanging tooth might constitute an invention when made in a cutter for trimming shoe soles, when it would not be in a cutter for milling metal, as would seem to be indicated in your answer to cross-int. 94?

Ans. I do think that it might be invention to incorporate a feature known in one art with features that are entirely novel to that art.

Cross-int. 99. Your last answer is of that indefinite character that it may apply to a mechanical appliance, a process, or a product. Can you or not state whether you do or do not think the change from a retiring to an overhanging tooth in a rotary cutting tool for trimming shoe soles might constitute invention, when it would not in a cutter for milling metal, and will you state what your opinion is upon this point?

Ans. I should think that under certain circumstances it might be an element of novelty, as, for instance, in the Orcutt patent, where the projecting face of his cutting tool is used upon blades having top-molded surfaces such as are described in his patent. It is the first time that we have any record of such a thing being done.

Cross-int. 100. Are the top-molded faces of Orcutt's cutter in any respect whatever different from the top-molded faces shown in Exhibit Brown Patent Gear Cutter, except in the configuration of the cross-section of the path which they will cut? If so, please state the difference.

66 Ans. No; they are not substantially different, except in the configuration of their molded surfaces, but that difference in configuration is most important. The change in form has produced another article entirely. It has made a leather shoe-trimmer instead of a gear-cutter.

(Counsel for defendants objects to all of the preceding answer after the word "surfaces" as being irrelevant, not responsive to the question, and an interpolation unwarranted.)

(Adjourned.)

BOSTON, *Jan.* 24, 1885.

(Counsel present as before.)

Cross-int. 101. You have spoken of the facility in the Orcutt cutter of sharpening its teeth upon the front face thereof without change or disturbance of the peripheral face or change of the path which the teeth will cut. Please examine the following-named Exhibits and state whether or not, in your opinion, they furnish all the facilities for such sharpening upon the front face without disturbance of the peripheral face.

(The exhibits referred to are taken from the case of Busell Trimmer Co. *v.* Corthell Man'f'g Co. *et al.* and marked 'Defendants' Exhibits Dunham Edge Cutter, Hazard's Improved Dunham Edge Cutter, Snell and Atherton Cutter, and Snell & Atherton Cutter No. 2, now put in evidence and re-marked with the title of this suit.)

Ans. They do, as I have testified before with regard to the old hand instrument.

Cross-int. 102. Please state whether or not two of these exhibits—Snell & Atherton cutter and Snell & Atherton cutter No. 2—exhibit in a marked degree the rake or overhang of the teeth, about which questions have been propounded and answers given in regard to other cutters.

Ans. They do; but they are not cutters in a rotary tool. The answers that I gave before were in connection with cutters upon rotary tools.

Cross-int. 103. Please state whether the two last-named exhibits have the appearance of having their teeth arranged in the arc of a true circle, in so far as relates to the cutting edges thereof;
67 whether they have the appearance of having the peripheral faces of their teeth-arranged eccentric to such circle to give freeing or clearance, and whether they appear to have had their periphery first molded in a lathe before having the teeth arranged to bring the periphery eccentric to the arc of such circle.

Ans. I am unable to state without accurate appliances for measurement whether the peripheral edges of these teeth are on a true circle or an ellipse or similar form.

One of them—Snell & Atherton cutter—has the appearance of having the peripheral edges backed off to give clearance which is unmistakable. Upon the other—Snell & Atherton cutter No. 3—the backing off is not so apparent. It is not easy to determine without the means for making an accurate test whether they are backed off or not; but I am willing to assume that they are, and I am willing to assume that the instruments may have been turned off in a lathe. If so, the peripheral edges of these teeth are somewhat eccentric to the axis of the circle on which they were turned.

Cross-int. 104. Suppose teeth like those shown in these two cutters had been extended around an entire circle having a center duly formed to be mounted upon an arbor, wherein, if at all, would such a cutter differ from that shown in the Orcutt patent?

Ans. That is exactly what Orcutt did and constitutes a part of his invention. The teeth, as shown upon the old hand plane, had never been used upon a rotary cutter until Orcutt did it, and where he made a difference between the form of teeth in the hand-cutter and his own patent cutter was to contrive these teeth so they could operate with a rotary rand guide by removing the part of the teeth of the hand cutter which were rounded off to operate as a rand guide, so that they could be adapted to the rotary rand guide to be successfully used as a rotary edge-trimming tool. If the teeth of the hand tool had been placed exactly as they were around a cylindrical hub they could not have operated successfully as a rotary edge-trimmer, because they would have torn the upper leather of the shoe; consequently ingenuity was required to complete the organization to make a successful rotary tool—that is, one that should be able to trim a sole edge without ruining the shoe, and therefore Orcutt modified the teeth of the hand plane so that they could
68 be arranged to work with another feature which had never

been used with them; namely, a continuous rand guide, all of which required ingenuity and thought.

(Counsel for defendants objects to all of the foregoing answer, first, because it is not responsive; second, it leaves the question entirely unanswered, and, third, because it is grossly and glaringly improper, in that all it contains is entirely within the province of the advocate or the final summing up of the judge; that it is not only partisan and argumentative, but the witness goes out of his way and evades the question in order to defend Orcutt's right to the patent which he has secured.)

Cross-int. 105. Please re-examine the last question and state, if you can and will, wherein the cutter therein supposed or suggested would differ, if at all, from that shown in Orcutt's patent, and in doing so please confine yourself to the mechanical features embodied in the Orcutt cutter and which would be embodied in the cutter suggested or supposed.

Ans. The hand cutter shown possesses a blade or blades having a front flat face to be ground and a top molded face to cut the rand, bed, and guard of the shoe, which form is to be left intact until the blades were used up. The rand guide is formed upon those blades by slightly rounding the outer edge of the rand-cutter. These hand cutters were reciprocating tools—that is to say, they cut when pushed forward and would not cut when drawn back to repeat the cut. They were designed to be used in no other way than as reciprocating cutters. Orcutt's cutters differ from the hand cutters in that they had blades applied upon the periphery of a cylindrical hub, and these blades had front flat faces to be ground and a molded form upon their peripheral edges which would trim the rand, bed, and guard of a shoe sole, and these molded faces were cut eccentrically to the axis of the rotary cutter and the molded forms would be left intact until the blades were ground away. The rand-cutter upon each blade has not a rounded surface upon its outer cutting edge to act as a rand guide, but the cutter is so made that a rotary rand guide may lie close up against the rand-cutter of each blade. The mode of operation of Orcutt's cutter differs entirely from that of the reciprocating hand tool, for it is a rotary tool cutting during all the time of its operation.

69 (Counsel for defendants objects to the entire answer, in that it is utterly irresponsive and assumes the question to be just the opposite of what it really is. The question asks for a comparison between the Orcutt cutter and another or supposed rotary cutter. The answer deals in an argumentative way with a reciprocating cutter as compared with Orcutt's, and not with a rotary cutter, as the question assumes. As the defendant deems it important to elicit an explicit answer to cross-int. 104 and insists upon his right to such answer, the examiner is requested to rewrite said question in order that the witness may have an opportunity to answer it.)

Cross-int. 106. Suppose teeth like those shown in these two cutters had been extended around an entire circle having a center duly

formed to be mounted upon an arbor. Wherein, if at all, would such a cutter differ from that shown in the Orcutt patent?

Ans. Supposing that the teeth of the hand cutter were placed around the periphery of a cylindrical hub, they would differ from Orcutt's cutter in this respect: They would not have a safe rand guide, but would be likely to tear the upper leather of the shoe, as the rounded edges upon the rand-cutter, which in the hand tool act as a rand guide, would form blunt, detached teeth when the blades were multiplied around a hub, which would be likely to tear the upper leather of the shoe. The difference between such a cutter and Orcutt's is that Orcutt's cutter has no such rounded edge upon the rand-cutters, but has a safe, continuous rand guide applied with it which makes it a practical and operative tool.

Cross-int. 107. Please examine the Exhibit Snell & Atherton Cutter No. 2 and state whether or not the edges of the teeth are not in perfect plane as much so as Orcutt's, and whether or not, if extended around the periphery of a hub, as supposed in cross-int-. 104 and 106, they would not co-operate with a rand guide just as well as would Orcutt's cutter.

Ans. They are not in perfect plane with the solid body of the tool, but are sligtly inclined from the plane of that solid body, or, in other words, would be slightly inclined away from a rotary rand guide if it was applied, and consequently would not co-operate with a rand guide, because it would leave a space between the teeth and the rand guide which would prevent proper trimming. Orcutt's teeth are in perfect plane with the body of the tool, and will produce perfect trimming in connection with a rotary rand guide.

Cross-int. 108. In view of the fact that rand guides had long before the date of Orcutt's alleged invention been made and were well known with their face, which is next to the cutter, in plane in some cases, concave in others, and convex in still others, do you really think, as a practical man and mechanic and as a patent expert, that the difference between the exhibit hand tools and Orcutt's, in the matter of the edge faces of the teeth being in or out of plane, could constitute in Orcutt's any element of invention, and could not, in view of the state of the art in that behalf, a man of the most ordinary skill in the art adapt a rand guide to a cutter, whether the edges of its teeth were in or out of plane? Would it involve anything more than mechanical labor of shaping the rand guide to co-operate with the cutter? In aswering this question please refer to the following patents as showing divers ways of accomplishing this object: Tayman reissue No. 9073, where the rand guide N, Fig. 11, is shown concave; Knight's, No. 157,476, where the rand guide D is shown chambered in Figs. 1 and 4; Busell, No. 167,874, where it is shown concave; reissue 8239, as showing the same characteristic; Busell, No. 188,337, where the guard H, Fig. 2, is shown convex; Bolling, No. 192,616, where the rand guide C, Figs. 1 and 2, is shown upon its inner face with a salient angle, and, in Fig. 6, with a convex inner face. Please answer this question in detail in the order in which the propositions are presented.

Ans. I think that once the conception had been formed of using teeth in the manner that Orcutt did—that is, of adapting the teeth of the hand tool to a rotary cutter—the mere matter of the inclination of the teeth from the plane of the hub would not have presented a difficulty in arranging a rotary guide (when the conception of using the tool with a rotary guide was also conceived) which a good mechanic would not have easily overcome, in view of the knowledge of the art acquired from the list of patents enumerated in the question. In that case it would involve no other than ordinary mechanical skill to shape the rand guide to the cutter.

Cross-int. 109. Do you mean to be understood in the last answer, where you say "that once the conception had been formed of using teeth in the manner that Orcutt did," that Orcutt conceived
71 any different use of teeth than what was known before in this art? If you think that Orcutt made any different use of teeth please state what that new use was, and, in doing so, state what you intend by the word "use."

Ans. My meaning would have been clearer if I had said, "Once the conception had been formed of employing teeth in the manner that Orcutt did." There is, however, a new method of using the teeth which Orcutt discovered and which had never been discovered before in a rotary leather-trimmer, and that was in placing the flat front faces of the teeth against a grinding tool without disturbing the molded top surface of the teeth.

(Noon recess.)

Cross-int. 110. It seems that in your last answer you confound and misapply terms; that "using" the teeth of a cutter properly applies to the office which they perform when operating upon a shoe sole, and not, as stated in your last answer, "in placing the flat front faces of the teeth against a grinding tool" (when sharpening the same), as is, according to the above quotation, stated in your last answer and is also inferable therefrom. Is not this proposition correct?

Ans. It seems to me that "use" may apply as you state it or as I stated it. Both may be correct.

Cross-int. 111. Does the rand guide when employed with the Orcutt cutter perform any other or different office than when employed with any other of the rotary cutters to which you have referred in your previous testimony? If you think it does please specify wherein you think such difference exists.

Ans. I do not think it does.

Cross-int. 112. Have you examined at any time the certified copy of file wrapper and contents of the Orcutt patent, which was an exhibit in the so-called Corthell suit, marked Defendants' Exhibit Copy File Wrapper and Contents Orcutt Patent, 1881?

Ans. No; I have never examined it.

(The said file wrapper and contents is now put in evidence and remarked in this suit.)

(Counsel for defendants desires witness to examine the same after the adjournment to-day, in order to save time, as he may desire to examine him in relation to it.)

72 Cross-int. 113. Is there any difference whatever between the Orcutt cutter and the cutter described and shown in Brown's patent in the matter of the facility for sharpening the same by grinding or in the facility for sharpening by grinding the flat front face without disturbing the configuration of the peripheral face? If you think there is any difference in these respects between the two please point out as concisely as you can wherein the difference consists.

Ans. They are alike in those respects.

Cross-int. 114. In view of the fact that it was not new at the date of Orcutt's patent to construct rotary cutters of other kinds with raking teeth, as stated by you in a former answer, and the further fact that the Exhibits Snell & Atherton Cutters have teeth like Orcutt's, which are raking, do you still think that it constituted any element of a patentable invention for Orcutt to arrange the teeth in his cutter raking?

Ans. I shall object to answering that question in its present form because it seems to me to ask my opinion upon a question of law, if I understand the question correctly. If you mean to ask me if I think it invention for Orcutt to arrange his teeth in connection with the other novel elements in a shoe-trimming tool as he did, I should still think that the employment of raking teeth was an element of invention.

Cross-int. 115. Please state why you object to answering the preceding question in the form in which it was put.

Ans. Only on account of the word "patentable," which was introduced.

Cross-int. 116. Did you not in answering direct Int. 5 understand that you were speaking of a patentable invention, or was you describing an invention that you deemed not patentable?

Ans. I was describing an invention which was patented and which the law had already passed upon.

Cross-int. 117. Then your opinion as expressed in answer to direct Int. 5 was based upon what the Patent Office had done in granting the Orcutt patent and not upon your own judgment. Is this so or not?

Ans. No, sir; I was called upon to state whether I thought a thing described in a certain issue from the Patent Office was an invention or not, and that was all.

73 Cross-int. 118. In answering the Int. 5 did you understand the question to refer to a patentable or non-patentable invention?

Ans. I stated my opinion with regard to an invention which the Patent Office had deemed patentable and for which it had granted letters patent. Of course, as they were the proper authorities to judge and had declared it patentable by their action, I am bound to believe it to be patentable also, and did so believe when I gave my testimony.

Cross-int. 119. Then please state whether you think the rake of the teeth in Orcutt's cutter, as shown in his patent, constitutes any element or feature in the claim therein.

Ans. I do not find any mention of the matter in the claim of the patent.

Cross-int. 120. Is it alluded to or mentioned in the patent itself?

Ans. It is.

Cross-int. 121. In what respect?

Ans. The patent states in these words: "The flat front faces, *a*, of the blades are not radial, but are so inclined as to make each blade slightly hooking and thereby form a knife edge at the intersection of the flat front face with the top surface, *c*, and its ridges 1 2 2. This is very desirable, for if the front faces, *a*, be not so inclined the tool will be a scraper rather than a rotary cutter."

Cross-int. 122. Please examine said patent carefully throughout, if you have not done so, and state whether you find anything therein which intimates even that this feature was new with Orcutt, or that he so claimed, or is it only alluded to in the language quoted, as many things are described in patents which, as in your own construction of the claim in this patent, does not claim a feature thus described?

Ans. I don't know why Orcutt put the language into his description nor do I attempt to construe his claims. When I am called upon as a mechanic to examine the various features of a mechanism in comparison with other mechanisms on record I extract all the novel features from that mechanism that I can see which lie within it, whether the inventor discovered and described them or not, and entirely without reference to him or what he thought.

Cross-int. 123. To return in this connection to your answer to Int. 5, in which you state (referring to the thing described in his patent) "to my mind the new thing described by Orcutt is
74 an invention and due solely to him," how did you intend or wish or expect to be understood with reference to the word "invention" as there used by you—that it was or was not a patentable invention?

Ans. I used the word "invention" in the sense which it ordinarily implies, namely, the contrivance of a new thing which did not exist before, and I stop there. Whether the new thing contrived and non-existent before is a patentable invention is the business of the Patent Office and not mine to decide.

Cross-int. 124. Did you give the answer to Int. 5 without reference, in your own understanding, as to whether the invention of Orcutt, as there alleged by you, was a patentable invention or not?

Ans. My opinion of the thing as an invention was formed by comparing it with what had been created before, and the only effect I am aware of that was produced upon me by the patent was the satisfaction of feeling that, in the main, my opinion was endorsed by the Patent Office. It was evident that the office considered the invention patentable, and I was bound to consider it the same.

Cross-int. 125. Your last answer does not meet the question, unless inferentially. Will you state directly, as the question asks, whether you gave the answer to Int. 5 without reference, in your own understanding, as to whether the invention of Orcutt, as there alleged by

you, was a patentable invention or not? Please answer it specifically one way or the other.

Ans. Yes; I gave my answer without reference to whether it was a patentable invention or not. It was none of my business.

(Adjourned.)

BOSTON, *Jan.* 27, 1885.

(Counsel present as before.)

Cross-int. 126. You have heretofore spoken of the facility for sharpening cutters like or similar to that shown in the Brown patent and have spoken of the method of sharpening the class of cutters which you have termed burr-cutters. Are you not aware that it is common and has been for many years since the introduction of solid emery wheels to grind the so-called burr-cutters upon the front face of the teeth instead of the top, in the same manner as the Brown cutter is sharpened?

Ans. No, sir; I am not aware of any such thing. In all
75 cutters with the burr teeth as they are called the universal practice, as far as I am aware, has been to sharpen them upon their peripheral edges—that is, upon the top or back face of the tooth. Until the introduction of the Brown & Sharpe tool it was the universal practice to sharpen all milling tools also in that manner, and it is within a comparatively recent date that the practice has obtained of sharpening even those cutters upon the flat front faces. It is within only a fortnight that one of the large machinery dealers applied to me to devise a sharpening machine for grinding cutters upon the flat front face of the teeth to take the place of the machine which is only just going out of date (that is, speaking generally of the machinist trade at large) for sharpening cutters upon their peripheral edges. I do not say that no tooth was ever touched slightly upon the flat front face, as well as upon the top or back face, just as a carpenter will grind his chisel upon the beveled face where it is intended to be ground, and will sometimes in whetting it, after doing the heaviest part of the work upon the bevel face, give two or three very light strokes upon the flat front face of the chisel. If these burr-cutters were ever touched upon the flat front face it was upon the same principle; the bulk of the work was done on the back faces. The reason of this is obvious, for if a tooth having only an acute angle that is formed by the flat front face with the top face were ground upon the flat front face the tooth would be very soon ground away, and the life of the tool would be very short.

Cross-int. 127. Has it or not since you have engaged in matters pertaining to machinery been equally well known in forming cutters to cut paths having an irregular cross-section to form such cutter either in an entire piece or in sections or gangs as it is sometimes termed?

Ans. It has.

Cross-int. 128. Have you been familiar with the employment of small solid emery disks in sharpening the teeth of rotary cutters; and, if so, for how long a time?

Ans. I have for, I should say, twenty years.

Cross-int. 129. Please state whether you find anything claimed in the Orcutt patent No. 238,303, dated March 1, 1881, which is not shown in the Orcutt patent No. 212,971, dated March 4, 1879,
76 and, if your answer be yea to the foregoing part of the question, please state specifically wherein such diversity exists.

Ans. If the question refers to the claims only, I find that the patent 238,303 claims a rotary cutter for trimming sole edges, the blades *d* of which are provided with flat front faces *a* and have their outer or peripheral ends *c* molded throughout to uniform shape, the converse of the desired shape to be given to the sole edge, and slightly eccentric to the axis of the cutter, substantially as described, and he describes and shows in his drawings such cutter blades set into slots in the periphery of a cylindrical hub.

Second. He claims a rotary cutter for trimming sole edges, the blades *d* of which are each provided with a flat front face, *a*, and a slightly eccentric outer or peripheral end, *c*, having formed thereon the end ridges 1 and 2 (namely, the rand and guard cutter), extending circumferentially across said face, substantially as and for the purposes described.

He claims in patent 238,303 a rotary cutter having teeth with their proper forms set into the periphery of a hub, and his drawings show such blades so set in, while in patent 212,971 he shows a rotary shoe-trimmer where the blades are solid with the hub, and also shows how the clearance may be effected.

Cross-int. 130. You misapprehend the scope or intended scope of Int. 129, to which your careful attention is again called; and the question in substance is this: Are or not all the features which are claimed in Orcutt's patent of 1881 shown in the drawings of his patent of 1879?

Ans. The features in the two patents are substantially the same, except that the patent of 1881 shows teeth detachable from the hub, while the patent of 1879 shows them solidly incorporated with the hub.

Cross-int. 131. Do you find in Orcutt's patent of 1881 anything in the claims, as they now appear therein, which was claimed (as appears by the copy of the file wrapper and contents) when the application was first filed in the Patent Office?

Ans. I find that he claimed in the original application blades secured in a hub of a rotary cutter having flat front faces to be ground and their outer or peripheral edges molded to a
77 counterpart of the desired ornamental shape to be given to the sole edge and adapted to be sharpened by grinding the front faces of the blades without disturbing the peripheral molded form. So far it is like the 1881 patent.

Cross-int. 132. Do you find that he claimed the features stated in your last answer—in the manner stated in the answer—or did he claim those features in connection with blades detachable from the hub?

Ans. He claimed it in connection with blades detachable from the hub, as I understand it.

Cross-int. 133. Please state whether or not the cutter shown in Orcutt's patent of 1879 does or does not contain every essential feature which is shown in Complainants' Exhibit Busell Cutter, Orcutt patent of 1881?

Ans. I should say that it did.

Cross-int. 134. Have you ever known or ever heard of a patent being applied for or granted for any of the various configurations of the peripheral face of rotary cutters embodying the essential features of the Exhibit J. R. Brown Patent of 1864, except in the instance of Orcutt's patent of 1881?

Ans. I never have.

Cross-int. 135. Suppose a person were now to decide to make a cutter with a different peripheral face from any ever before made, but embodying the essential features of Exhibit Brown Patent, which cutter was designed and adapted to produce a well-known article or result of well-known form, but which had not been before produced by a cutter embodying the essential features of the Brown patent, do you believe that a valid patent could be obtained for such cutter when, as stated, no new result was produced?

Ans. I must positively decline to answer this question unless you change its form so that you do not ask my opinion of the patentability of a novel idea.

Cross-int. 136. Do you believe that it would constitute invention in the sense employed in the patent law to make a cutter embodying the essential features of Exhibit Brown Patent, with a peripheral face not before made on such cutter, but adapted and intended to produce a result which had been well known for twenty-five years—that is, to cut a path or form which was old and well known?

Ans. Under certain circumstances I do, and under cer-
78 tain other circumstances I do not. [There are cases where a change in form of an article produces entirely different results, and where such form entirely changed the functions of the article. If, for instance, Brown's cutter, which was designed for metal-cutting and to be used in an organization designed for its employment as a metal-cutter, should have its configuration changed from that which Brown originally showed for cutting any metal whatsoever, that would not be invention, however novel the form might be, because such change would be obvious and entirely within the capacity of ordinary mechanics. It would be in accordance with all the habits of thought engendered by working in the metal art. There would be nothing in that art to indicate to a man pursuing it that that cutter was applicable in any sense to cutting wood or leather, for the cutting of which totally different practice is required. There would be nothing without special study and experiment that a man in the metal trade could ascertain about either leather or wood cutting from any organization in which cutters were used in his own art; and the best proof that this is so is the fact that no man exclusively confined to the metal art seems to have had any suspicion, so far as appears upon the record, that there was any element in the Brown cutter which could be applied to a tool for cutting the softer materials, such as wood, for instance, and far less

for the spongy, springy material, leather, which required an experience totally distinct from his own, and which required the application of principles wholly outside of his own art in addition to the simple abstract principle found upon the Brown cutter. The keen intellectual perception to detect two ingredients upon a Brown cutter which might be united with ingredients found in a totally distinct and unanalogous art, I should say was upon that lofty plane entitling it to the dignity of invention. The change in form which was necessary to be made totally changed the nature of the instrument. It produced a novelty, and it produced a new and exceedingly useful effect. It made a tool totally unlike the metal-cutting tool, for it made a tool which in no proper sense could cut metal, even if placed in the same organization which would operate the Brown tool, and this is one of the best proofs of its entire change and of its novelty, for if it was the same tool it would produce the same effects when used in the same manner.

79 While it would not be invention if the conformation of the peripheral surface of the Brown tool was changed for anything in the metal art, the change which would make it a new tool in a totally distinct and unanalogous art, where it produced entirely new results of the most important character for the first time—that, in my opinion, is fairly and honestly invention. But, to go further, if now the idea having been made public and common that the principles involved in the Orcutt cutter are perfectly applicable to cutting materials other than metals, and one should change its peripheral, molded form to cut any softer material whatsoever, after this exposition by Orcutt, I should say it would be an obvious change and not invention. The field is covered.

In explanation of what I mean that a change of form frequently makes an entirely different article, the example might be taken of a quill. A quill is a quill. Change its form slightly and it is a tooth-pick. Change its form again by slitting the point of the tooth-pick and you have a third article—the pen. Of course the pen is a quill, but a quill isn't a pen. The tooth-pick is a quill, but a quill isn't a tooth-pick, and a tooth-pick isn't a pen, although, as a mechanical feat, you may dip a tooth-pick into ink and make marks, but it would not be in any proper sense writing.

Another instance of where invention is involved by change of form is the gimlet-pointed screw. A screw is a screw, and the gimlet point was on the end of a gimlet, but by blending those two old well-known things a new article was produced which would operate in a totally different manner from the old screw, and when the combination had been made it might be said that we have nothing after all but an old article changed in form, but it produced entirely novel results that could not be produced by the old form. An old-fashioned screw required the employment of a tool to make a hole for it, but the improved form of screw—the gimlet-pointed screw—did away with the extra tool and could be screwed into the wood where the other could not.]

(Noon recess.)

(Counsel for defendant objects to all the foregoing answer included between brackets, to wit, all from the words " I do not " to the end thereof, for the reason that the same is not called for by the question, is argumentative, and embraces many matters not called for in the question.)

80 Cross-int. 137. In your testimony-in-chief, as also in cross-examination, you have spoken of the organization in which the Brown cutter was intended to be used, and also of the fixture which the article or thing upon which the cutter operated was held in the milling machine. Do you understand that when a shoe is trimmed by the Orcutt cutter it is held in the same or any different manner than when it was trimmed by any of the other and earlier rotary cutters?

Ans. The shoe is held substantially as it was held with ordinary rotary cutters.

Cross-int. 138. Did you ever see a shoe trimmed with any other rotary cutter except Orcutt's?

Ans. I don't know whether I ever did or not. I do not remember at this time.

Cross-int. 139. Suppose the art of trimming shoe soles by means of rotary cutters to be unknown to this date, and that at the date of Orcutt's having first made the cutter shown in his patent of 1881 he had made that identical cutter to be used in a machine for milling metal. Do you think it would have been an invention, such as the patent law contemplates?

Ans. It certainly would not have been an invention for cutting leather in any sense contemplated by anybody.

Cross-int. 140. Suppose Orcutt had made the cutter shown in his patent of 1881 at the date of his application for that patent, and it had been used exclusively and only to this date in milling machines for milling metal, and now, for the first time, some one should conceive the idea of using that cutter for trimming shoe soles. Do you think that such conception would constitute an invention, such as the patent law contemplates?

Ans. It is asking me to suppose an impossibility, for a cutter made with a delicate rand lip and guard, such as his tool shows, with the fine, delicate angles upon the blades of his tool for cutting leather, could not have been used upon metal-cutting in any practical sense.

Cross-int. 141. Would not such a cutter mill brass (an alloy of copper and zinc), composition (an alloy of copper and tin), britannia, and numerous other well-known metals?

Ans. It might as a mechanical feat, but not in any practical sense.

81 Cross-int. 142. Please compare Complainants' Exhibit Busell Cutter (Orcutt's patent of 1881) with Defendants' Exhibit Colt's Armory Cutter No. 4 and Defendants' Exhibit Colt's Armory Cutter, and state whether, in your opinion, the Orcutt cutter is not as well adapted to milling metals as either of the other named exhibits.

Ans. No; it is not.

Cross-int. 143. If the Exhibit Colt's Armory Cutter No. 4 could be practically used in milling steel, might not the Orcutt cutter be practically used in milling the alloys named in a preceding question?

Ans. If the Colt's armory cutter No. 4 could be practically used in milling steel, I think the Orcutt cutter might be as practically used in milling the soft alloys named; but, from the appearance of Colt's armory cutter No. 4, with seven teeth broken out in one piece and five in the other, I do not think a good mechanic would say that they bear the evidence of what might fairly be called "practical use" in cutting steel. It is very evident that the cutters were put to a very unusual use for a steel-cutting tool, and their broken teeth are the best evidence of that fact.

Cross-int. 144. Suppose a witness should testify that he had worked in Colt's armory for 27 years, that his business had been the making of rotary milling tools, and he should testify to you that these cutters—Colt's armory cutter No. 4—were made in 1877, they were used in cutting steel on a piece designated as top lever in Colt's shotgun, used on every lever that is made for the Colt gun—that there was no difficulty in milling steel with teeth as thin as those in that cutter, provided the depth of the cut was graduated with due reference to the teeth. Would that change your opinion in the least with regard to the practicability of using those cutters upon steel, cast iron, wrought iron, and other metals less difficult to cut than steel?

Ans. I should want to know, in the first place, how many levers he had cut, what kind of labor he employed in the use of the tool, whether highly skilled or such skill as is usually employed with milling-cutters, how many cuts per day he had made, before I could make up a judgment. If he testified to me that the same class of labor was employed with those cutters that is customarily
82 employed in operating milling machines, and that "there was no trouble" in using such cutters in turning out the same quantity of work which is turned out with ordinary mills and with the same common skill, I should not believe what he said, but I would point him to those cutters with their teeth broken out as carrying their own evidence that the cutting principle was carried to its utmost extreme, and that their employment required a skill beyond that usually employed upon milling machines. I should regard those cutters as illustrating the extreme possibilities of the art.

Cross-int. 145. Do you think it would or would not be practical to mill cast iron of the ordinary kind with cutters like Complainants' Exhibit Busell Cutter (Orcutt patent of 1881)?

Ans. No; I do not. It would be possible, but not practical. It would be possible—the same that it would for water to wear a stone. It would not be practical to apply that process in a stone yard as a substitute for the usual means.

Cross-int. 146. Do you think that the two processes referred to in your last answer would be comparatively slow?

Ans. There would be some difference in favor of the cutters, but the cutting edges of those cutters could last but a few seconds in cutting iron.

Cross-int. 147. Returning now to cross-int. 140, will you please state whether or not, in your opinion, if Orcutt, at the date of his alleged invention, had made the identical cutter shown in his patent for the purpose of cutting metal in a milling machine, and it had been so exclusively used to this time, and that now some one should conceive the idea of using it for trimming shoe soles, would such conception constitute such an invention as the patent law contemplates?

Ans. In such a case as that, and although there would be thought, ingenuity, called into play and a new result produced in conceiving the possibility of its use in an entirely different organization, its merits as an invention would be reduced. It would be, however, in that case a new and useful improvement in the art of cutting or trimming leather soles for the benefit of the community, and there would be invention in it, and there would be enormous profit in it accruing to the community through the man who made that improvement. He certainly, in that case, would have produced
83 a new leather-cutting instrument where none like it existed before. Whether such an invention would come within patentable invention or not is what the Patent Office would have to determine.

Cross-int. 148. What do you think about it?

Ans. If you ask my individual opinion about it, I will give it for what it is worth—that is, if the man had made an improvement, even of this character, through thought, study, or unusual ability, and he alone had succeeded of the great numbers struggling toward the end in competition with the brightest minds who had hitherto failed, I think he ought to be rewarded for the great benefit he had conferred upon the community by the only means which the community can give in exchange through its agents, the Government, to wit, a patent.

(Adjourned.)

BOSTON, *Jan.* 28, 1885.

(Counsel present as before.)

Cross-int. 149. You have repeatedly, both in direct and cross examination, spoken of the "organizations" in which the cutter shown in the Brown patent and in the Orcutt patent were intended to be used, and have evidently laid much stress upon that matter. Do you or not think that the organization or machine in which a rotary cutter is intended to be used or is generally used has anything to do with its novely as an invention such as is contemplated by the patent law?

Ans. Indirectly, yes. Take Brown's gear-cutter, for example. The patentee presumes a certain knowledge upon the part of those who will use his tools of a well-understood organization for its use, and he is obliged to presume upon that knowledge or else describe in his patent how his tool should be used, for if no such knowledge

existed he must describe the organization so that his cutter could be used, or else he could not have given to the world a gear-cutter. Suppose nothing was known of the organization necessary to be used with his invention, then the world would not have had a metal gear-cutter; for, *per se*, Brown's invention could not cut a gear. The organization which he presumes was understood is absolutely essential to go with his cutter before it can cut a gear.

84 (Counsel for defendants objects to all of the above answer except the first two words for the reason that the remainder is entirely within the domain of the advocate and a gross abuse of the position of a witness.)

Cross-int. 150. Please reconsider cross-int. 149 and state whether you do or do not think that the organization or machine in which a rotary cutter is intended to be used or in which it is generally used has anything directly to do with its novely as an invention.

Ans. I can give no different answer from that already given.

Cross-int. 151. Suppose the Brown cutter or cutters embodying the essential features described and claimed in his patent had long before the date of Orcutt's invention been made with a peripheral face adapted to trim some of the well-known styles of shoe-sole edges, do you think that it would be an invention to afterwards shape the so-called Brown cutter to trim other and different well-known styles of shoe-sole edges?

Ans. If a cutter had been made previous to Orcutt's time having the features upon it which Orcutt described and claimed it would not have been invention for Orcutt to have made a cutter afterwards having the same general features.

Cross-int. 152. Your previous answer entirely evades the question, which is predicated upon the fact that is or should be well known to you as an expert testifying in relation to this art, that shoe-sole edges are of great variety of style and form. Please examine the question and observe that it asks whether if, before the date of Orcutt's invention, cutters embodying the essential features of Brown's patent had been used to trim some of the well-known styles of shoe-sole edges, do you think it would have been invention to have afterwards shaped the so-called Brown cutter to trim other and different styles of shoe-sole edges? Please give an answer to said cross-int. 151 upon the points here repeated.

Ans. The question is put in such general terms that I do not know that I understand it; but if it means that previous to Orcutt's time a cutter had been made with the peculiarities described in Orcutt's patent which would trim the three fundamental forms upon a shoe sole, namely, the rand, bed, and guard, and Orcutt had changed the special configuration for these three cuts into any fanciful forms which would still embody these fundamental forms, it would

85 not have been invention, because such changes were obvious; but if the question means that a cutter had been made that would make, for instance, one of the said fundamental forms—the bed, for example—and no one had known how or thought to put in the other two, the merits of his invention would have been reduced

to just that extent. He would have produced a novel tool for trimming sole edges and would have produced vast benefits to the trade, because he would have cut three forms instead of one; in other words, the sole would have been trimmed in one-third of the time that it could have been cut before, and there would have been a saving of two-thirds of the expense of trimming a shoe sole. That describes an improvement which would have been new and results which would have been useful.

(Counsel for defendants waives the reading the answer unless the witness desires to have it read, and objects to the whole of it for the obvious reason that it is a gross and improper waste of time for a witness to evolve a string of theories about a question which he confesses that he does not know whether he understands it or not. If he understands it, it would be proper to answer. If he does not understand it, or, in his own language, "does not know that he understands it," he should say so and no more.)

Cross-int. 153. You have spoken of Orcutt's cutter being adapted to trim at the same time the rand, the bed, and the guard of a shoe sole, or, as you term them, the three fundamental principles of the shoe sole. Do you or not regard Orcutt as the first to accomplish that result with a rotary cutter?

Ans. I do with a rotary cutter having blades with a front flat face to be ground and a top molded surface not to be ground.

Cross-int. 154. Will you please answer the foregoing question in the terms in which it is put and without a qualification in your answer, which is not called for in the question? The examiner is requested to re-read the foregoing question.

(Question re-read.)

Ans. No; I do not. Others had made different cutters intended to accomplish the same purpose.

Cross-int. 155. Suppose Defendants' Exhibit Colt's Armory Cutter No. 4 to be adapted to trim shoe soles of a well-known
86 form or style and with good results and to have been made long before Orcutt's invention and adapted to be used with a rand guard in a manner long well known, do you think it would be an invention for Orcutt to make a cutter adapted to trim other and equally well-known forms of shoe-sole edges? Please give your opinion as concisely as you can and note that you are not asked to give reasons to fortify your opinion.

Ans. Suppose that Colt's armory cutter No. 4 had been adapted to cut leather and to be used with a rand guide, it would no longer have been a metal-cutter, which it is now, but a leather-cutter. Its capacity to cut metals would have ceased, and it would have been substantially like the Orcutt cutter; consequently it would not be invention for Orcutt to have followed it with another similar to it, although varying somewhat in the configuration of the top molded surface.

Cross-int. 156. You appear to have misunderstood or to have misconstrued the preceding question, which is now repeated substan-

tially, but in different terms, as follows: Suppose Defendants' Exhibit Colt's Armory Cutter No. 4 as it was originally made to be capable of use to trim shoe soles of a well-known form or style and with good results and to have been made long before Orcutt's invention and capable of being used with a rand guide in a well-known manner if any one had seen fit to so use it in trimming such sole edges, do you think in such case it would be an invention for Orcutt to make a cutter also embodying the essential features of the Brown patent, but shaped to trim other and equally well-known forms of shoe-sole edges?

Ans. Supposing that cutter to possess the qualities necessary to trim a shoe-sole edge in a proper mercantile sense (the possibility of which I deny) and had been used previous to Orcutt's time with a rand guide to trim a sole, then I do not think Orcutt's tool as an invention could have fairly been called an invention; but the existence of such a tool, with these capacities totally undiscovered and with no knowledge on the part of the public of how to use it as a leather-trimming tool, would not have detracted from the merits of Orcutt's invention until he or somebody else had had the keen intellectual perception and had applied the requisite study and experiment to transfer that tool from the metal art and its existing organization to run it to another organization in a totally dis-
87 tinct art, to be used in a totally different manner. The leather trade would have remained unimproved and without benefit from its existence.

Cross-int. 157. In the preceding answer, in speaking of the capacity of Exhibit Colt's Armory Cutter No. 4 to trim shoe-sole edges of a well-known form with good results, as inquired of in cross-int. 156 or as stated by you in your answer to said int., "in a proper mercantile sense," you state, "the possibility of which I deny." If, as appears from your testimony, you have never seen those cutters used and do not know that you have seen shoes trimmed with rotary cutters, except once just previous to your giving your testimony in this suit, upon what basis, data, or knowledge do you deny the possibility of the cutter inquired of to trim shoe-sole edges of well-known form with good results?

Ans. I judge by what I know of leather-cutting tools that the shape of the teeth in Colt's armory cutter No. 4 is not such as would be proper for first-class trimming of shoe soles. The teeth are not raking enough, and the angle formed by the front flat face and the top face of the tooth is too blunt, and does not, in my judgment, afford a proper keen-cutting edge to do good and rapid work. I think also that the radii of the top of the teeth shorten too rapidly to make a good cutting tool.

Cross-int. 158. In answer to cross-int. 156 you state, "but the existence of such a tool with these capabilities totally undiscovered and with no knowledge on the part of the public of how to use it as a leather-trimming tool," etc. Do you or not wish to be understood and do you or not believe that if a given cutter, capable of trimming shoe soles "in a proper mercantile manner," as you term it, had been made and used solely for milling metal that it would constitute in-

vention for some one to discover that it could be used in a mercantile manner for trimming shoe-sole edges and with good results to the public?

Ans. If it had been discovered that a cutter, as it had been used for cutting metal in the manner that it was used for cutting metal and by the means for cutting metal, could trim a shoe sole under the same conditions precisely, then I should say that such discovery would have very little merit as an invention, but when it is known that the cutter as so used and in the manner and with the
88 means employed with it in metal-cutting was utterly incapable of cutting a shoe sole, and required the thought and ingenuity to adapt it to a totally different organization to become a leather-cutter in an art totally distinct and unanalagous to the metal art, then I believe invention is called into play.

Cross-int. 159. The question is repeated with a request that the witness will make a reasonable effort to avoid and abstain from argument, hypotheses, suggestions, and supposititious facts, and that he will give an answer either in the affimative or in the negative, without circumlocution or evasion, as counsel for defendants believes the question to be clear, unambiguous, and susceptible of a direct and not lengthy answer. If the witness deems the question indirect, ambiguous, or not capable of a direct and not lengthy answer, will he please point out his reasons therefor that counsel for defendants may correct the question and save time. (Question repeated as requested.)

Ans. I do believe that it would have been invention.

(Noon recess.)

Cross-int. 160. In view of the facts that the facility for grinding the Orcutt cutter by grinding the front flat face without disturbance of the periphery is identical with that found in the Brown patent cutter and the Exhibit Snell & Atherton Hand Shoe Trimming Tools; that, as you have stated, it would require only ordinary skill to apply a rand-cutter to a rotary tool if made in the exact similitude of the said hand tool continued to an entire circle; that the result or product of the Orcutt cutter—the sole edge trimmed by it—is identical with that trimmed by said hand tools; that the shoe is held in the same manner when being trimmed by the Orcutt cutter as any other rotary cutter; that it was common before Orcutt's invention to use a rotary rand guide with a great variety of rotary cutters, and that it was also common before his invention to trim the rand, the bed, and the guard of a sole at one and the same operation with a rotary cutter, as you have stated, do you find anything invented by Orcutt except to give a certain form or configuration of cross-section to a cutter embodying the features of Brown's patent of 1864? If you do find any other features in the Orcutt patent please point them out specifically and precisely, and in pointing out such features, if you attempt so to do, please to avoid generalities and confine yourself, as the question
89 asks, to the features found in the cutter, as referred to in the specifications and claims of his patent.

Ans. I shall object to answer that question in its present form, for it assumes that I said what I am not aware of having said—that the fitting of a rand guide to a rotary cutter composed of blades of the exact form of the blades of the old hand plane, where the rand knife has rounded edges to make the rand guide in the hand tool, was a thing which any ordinary mechanic would have done without ingenuity. I am not aware of having said that, and I am not willing to have that inference drawn. If I said anything that has that appearance it was a mistake.

Cross-int. 161. Before answering cross-int. 160 please state whether you think it involved invention to employ a rand guide in connection with the Orcutt cutter, and, if you think it did, please state also whether it performs any other or different office or effects any other or different result in any respect from that which it performed or effected when used with other and earlier rotary cutters than Orcutt's, to some of which your attention was called in a previous question. If you think it does accomplish any different result or perform any different office please specifically point out in what the same consists.

Ans. It did require the contrivance of something that was new to replace the rand guide of the hand tool with a rotary rand guide when the blades of the hand tool were put into a cylindrical hub. If the blades in the form in which they existed upon a hand tool had been put into a cylindrical hub with the means upon them which acted as a rand guide in the hand tool they would not have worked for the reasons given in my previous testimony. They would form blunt edges, which would have torn the upper leather of the shoe. A change in the cutter blades, therefore, had to be contrived, so that they would operate with the rotary rand guide. When this contrivance was effected, then the cutter would act similarly to other cutters which had rotary rand guides.

Cross-int. 162. If you intend to answer the previous question and not evade it, which you have thus far done, whether intentionally or not, please state first, as the question asks, "whether you think it involved invention to employ a rand guide in connection with the Orcutt cutter."

Ans. Not *per se*.

Cross-int. 163. Does the rand guide as employed with the Orcutt cutter perform any other or different office or effect any other or different result from that which it performed and effected when used with other and earlier rotary cutters than Orcutt's, to some of which your attention was called in a previous question. If you think it does, please point out in what the same consists.

Ans. I have said that it did not after Orcutt had so contrived his tool that it would act with a rand guide. It performs no new office that I am aware of.

Cross-int. 164. Is Orcutt's cutter "contrived" in any different manner "to act with a rand guide" than are various other earlier cutters which act with a rand guide, and to which reference has been had during your examination? If you think it is, please point out specifically wherein the difference consists.

Ans. It acts with a rand guide substantially as other rotary cutters did.

Cross-int. 165. Having ascertained your views with reference to the novelty or lack thereof of the employment of a rand guide with the Orcutt cutter, cross-int. 160 is now repeated in substance as follows: In view of the fact that the facility for sharpening the Orcutt cutter by grinding the flat front face without disturbing the periphery is identical with that found in the Brown patent cutter and the Snell & Atherton hand trimming tools; that rand guides were in common use with rotary cutters, and that it would not, as you state, constitute an invention *per se* to employ it with Orcutt's cutter; that rand-cutters were in common use, both with hand tools and rotary sole-trimming tools; that the result or product of the Orcutt cutter, to wit, the sole edge trimmed by it, is identical with that trimmed by the hand tools; that the shoe is held in the same manner when being trimmed with the Orcutt cutter as with any other rotary cutter; that it was common before Orcutt's invention to trim the rand, the bed, and the guard at one and the same operation with both hand and rotary cutters, do you find anything invented by Orcutt except to give a certain form or configuration of cross-section
91 to the peripheral face of a cutter embodying the features of Brown's patent of 1864? If you do find any other features in the Orcutt patent, please point them out specifically and precisely, and in doing so please avoid generalities and confine yourself, as the question asks, to the features found in the cutter as described in his specification and defined in his claims.

Ans. If I understand the gist of this intricate question, it amounts mainly to this—to ask me what the difference is between Orcutt's invention and Brown & Sharpe's cutter.

I have stated and restated this several times. Orcutt made his cutter of different peripheral face from Brown & Sharpe's cutter, whereby he was able to cut the rand, bed, and guard in a shoe after he had also changed entirely the conformation of the teeth by raking them forward on the flat front face and producing an angle by the flat front face and the top peripheral face, which should afford a keen cutting edge for leather, and then placing it in a structure in which Brown & Sharpe's tool could not work to cut metal as Brown intended that his cutter should. He made this difference between the Brown tool and his own—that he completely changed its character, so that it could not cut iron in any proper sense in any structure whatever, while Brown's could cut metal where it was intended it should.

In the matter of simply employing a rotary cutter with a rand guide or of simply making a tool which could cut the rand, bed, and guard of a shoe, Orcutt did not do this for the first time, but he created a structure which differed in form and principle from any tool previously used for the operations of trimming the rand, bed, and guard, because he produced a tool which had blades having top-molded faces the converse of the form of the sole edge to be trimmed, and the flat front faces of the teeth were so inclined forward that they could make a proper cutting edge for leather, and

those faces could be ground without disturbing the top-molded face of the teeth. These properties were never possessed by any other rotary sole-edge trimmer, and these constitute the novel differences between Orcutt's cutter and any of the other leather-trimmers referred to.

Cross-int. 166. As you have entirely evaded the question and have introduced a mass of matter not called for, the preceding question is repeated in substance, but changed in form, in order, if possible, to avoid any seeming ground for your characterizing it,
92 as you did the last, as an intricate question, and it is now repeated in this form: In view of the fact that the facility for sharpening Orcutt's cutter without disturbance of his periphery is the same as in Brown's patent cutter and the Snell & Atherton hand-trimming tools; that the rake or overhang of the teeth has been admitted by you to be the same as in the Snell & Atherton cutters; that rand guides were long employed with rotary cutters before Orcutt's alleged invention, and that the employment of such guide with Orcutt's cutter would not constitute an invention *per se*; that rand-cutters were in common use both with hand tools and rotary sole-trimming tools before Orcutt's; that the result or product of the Orcutt cutter, to wit, the sole edge trimmed by it, is identical with that trimmed by the exhibit hand tools; that the shoe is held in the same manner while being trimmed by the Orcutt cutter as with any other and earlier rotary cutter; that before Orcutt's invention it was common to trim the rand, the bed, and the guard at one and the same operation with both hand and rotary cutters, do you find anything invented by Orcutt except to give a certain form or configuration of cross-section to the peripheral face of a cutter embodying the essential features of Brown's patent of 1864? If you do not understand this question, as your former answer seemed to imply in relation to the former question, please say so and no more; if you do understand the question, please then answer as concisely as you can the conclusion to this question, to wit, whether you do or do not, in view of the recital in the question, find anything invented by Orcutt except to give a certain form or configuration of cross-section to the peripheral face of a cutter embodying the essential features of Brown's patent of 1864.

Ans. The varied form of this question conveys no different impression to my mind from the other; hence I have no different answer to make.

Cross-int. 167. In view of all the facts elicited during this examination and as testified to or admitted by you, do you or not think that Orcutt's alleged invention embraces anything more than that he gave a certain form or configuration of cross-section to the peripheral face of a cutter embodying the essential features of Brown's patent of 1864?

Ans. I do.

93 Cross-int. 168. What more or what other feature did Orcutt's alleged invention embrace? In answering this please confine yourself to the subject-matter of his invention, to wit, his cutter, and leave out the machine or organization, as you term it, in which either

milling-cutters or rotary cutters are employed, unless you can find the same embodied or referred to in his patent as constituting some part of his invention. In other words, please confine yourself to the tool he claimed to have invented and not to the machine that might or might not be used.

Ans. Besides the addition to the peripheral form constituting a trimmer which could trim the rand, bed, and guard of the sole, he so altered the teeth by giving them the requisite rake and the proper angles as would make them cut leather instead of iron, and thereby made a cutter which could not cut iron, in any proper sense, in any structure whatever, and he put more teeth into the periphery of the hub, thus reducing the space between the teeth, thus making it a proper cutter for leather and an improper one for iron, and he then adapted it to be used with a rand guide, thereby making teeth so slender that, though perfectly proper for a leather rand-cutter, were in no proper sense suitable for cutting iron.

(Adjourned.)

BOSTON, *Jan.* 29, 1885.

(Counsel present as before.)

Cross-int. 169. In view of the rake of the teeth in the Snell & Atherton hand cutters and in the cutter shown in Complainants' Exhibit Old Busell Cutter (now put in evidence), and assuming the latter to have been well known at the date of Orcutt's invention, do you really think that the rake of the teeth in Orcutt's cutter constituted an element of Orcutt's invention?

Ans. In connection with the other elements that he used, yes.

Cross-int. 170. Wherein does the rake of the teeth in Orcutt's cutter effect any different result or perform any different office from what it does in the hand tools or in the Exhibit Old Busell Cutter?

Ans. I don't think it does perform any different office, taken by itself, except this, that the rake in the old Busell cutter is in a tool that cut merely the bed form of the sole, whereas in the Or-
94 cutt cutter it is with an instrument which cuts all the forms known for a sole edge, and in connection with the forms in a rotary cutter which are not to be disturbed in grinding. The difference in effect between the rake of the Orcutt cutter and the effect produced by the rake in the old hand tool is that in the Orcutt tool the rake is upon teeth which can cut all forms of a sole during all the time that the cutter is in use, because it is a rotary cutter, while upon the hand tool the teeth, although raked in a similar manner, can cut only part of the time that the tool is in use, because it is a reciprocating cutter. That is the difference in function which is established by what Orcutt has done.

Cross-int. 171. Does the rake of the teeth perform any different office in cutting the rand and guard than it does in cutting the bed?

Ans. Only in the manner stated.

Cross-int. 172. What is that?

Ans. I mean as between the Orcutt tool and the hand tool, which can cut also the rand and the guard.

Cross-int. 173. Question 171 is repeated in different form. Does the rake of the teeth in the Orcutt cutter perform any different office in cutting the rand and the guard than it does in cutting the bed?

Ans. It does not.

Cross-int. 174. Then if it was known before Orcutt that the rake of the teeth was beneficial in cutting the bed, wherein does it constitute invention to extend the same feature to the rand and the guard?

Ans. Taken *per se*, I don't know that it is invention, but to rake a tooth, in connection with other novelties, is to combine a known feature with unknown features, and it then becomes, I think, an element of invention.

Cross-int. 175. You state in answer to cross-int. 170 that "the difference in effect between the rake of the Orcutt cutter and the effect produced by the rake in the old hand tool is that in the Orcutt tool the rake is upon teeth which can cut all forms of a sole during all the time the cutter is in use, because it is a rotary cutter." Do you really think that the fact that the teeth in one cutter advanced continuously, while in the other they cut when advanced and then returned to repeat the movement, constitutes any difference in the effect or function of the rake of the teeth? And, if so, please state why.

95 Ans. It increased the effect of the trimming tool by the saving of time which was lost in drawing the reciprocating tool back, during which the latter did not cut; consequently increased the amount of work that could be done in a day.

Cross-int. 176. Do you see any other difference except that the amount of work was increased, but not the function of the rake, and do you understand the difference, or do you think there is any, between the increase of a result and producing a new result or function?

Ans. Function means performance; therefore the function of the tool was changed, because its function was largely increased; thus a new result was produced. The old result was a certain quantity of work done; the new result was double the work done, more or less.

Cross-int. 177. In answer to cross-int. 168 you instance as one feature of Orcutt's invention that "he put more teeth into the hub, thus reducing the space between the teeth." Do you think, in view of the number of teeth shown in Exhibit Knight's Patent, in which is shown a cutter with twenty-two teeth, and the Exhibit Corthell Patent of 1878, in which is shown a cutter having twelve teeth, that it would constitute invention to make a cutter having more teeth than are shown in one patent and less than shown in the other, and especially in view of the fact that the Corthell cutters were made with eighteen teeth, when Orcutt showed sixteen in his patent and so makes his cutters?

Ans. The comparison that was instituted in that question was between the Brown cutter having teeth which could be ground upon

the flat front face and Orcutt's cutter. There is an element of rankness and the possibility of getting a tooth with a proper cutting edge for leather that came into that question. The mere putting of a given number of teeth into the periphery of a cutter, more or less, taken by itself, would not constitute an invention, but taken in connection with other novelties, I think it would constitute an element of invention.

Cross-int. 178. Your last answer, if such it be called, does not meet the question, which asks you to give your opinion, as an expert, as to whether the increase in the number of teeth by Orcutt, as stated by you in cross-int. 168, and as quoted in the preceding ques-
96 tion, would, in view of the state of the art as shown in the Knights and Corthell patents and the Corthell cutter, constitute an element of invention. Will you give your opinion upon this point?

Ans. *Per se*, it would not.

Cross-int. 179. Suppose you were to be shown an exhibit of metal milled by a cutter such as are employed for trimming shoe-sole edges, would it in any degree change your opinion which you have expressed, that the Orcutt cutter is in no sense a milling-cutter?

Ans. Not in the slightest degree. It would be a mechanical feat. It would be the same as if a jack-knife were to cut a piece of metal. It might be done as a mechanical feat, but it would not be a legitimate iron-cutting tool when used in a legitimate manner. It would not affect my judgment any more than it would to cut a piece of metal with glass.

Cross-int. 180. Does this difficulty arise from the slight form or bulk of the rand-cutting teeth of the Orcutt cutter, or from what does the difficulty arise?

Ans. I wish to premise before further answer that when the term metal is employed I desire to be understood as referring to the metals which are usually cut by metal-cutters, and not to pewter or lead or those alloys which it is not customary in the trades to cut with milling-cutters.

(Counsel for defendants at this point requests the witness to specify what he regards as the usual metals to cut with milling-cutters.)

Wrought iron, steel, and cast iron, and not the soft metals, which are melted and run into any special form which are desired, except cast iron and the harder forms of brass.

Resuming now the answer: It would result partly from the slight form of the rand teeth, and partly from the delicate nature of the edge of the teeth which would not stand against the hard metals. The cutter would require to be used against the metals with a delicacy which is not practical in any economical sense in metal-cutting; and the tools, even to perform a mechanical feat, would require repeated sharpenings and a loss of time to do work in any quantity at all comparable with the quantity produced by proper milling-cutters, which would render their use impracticable in any fair sense.

97 Cross-int. 181. In view of the relative height and thickness at their base of the rand-cutting teeth in Exhibit Busell Cutter (Orcutt patent of 1881), and the thin teeth shown upon the recessed side of Exhibit Colt's Armory Cutter, which do you regard as the better adapted to mill metal?

Ans. Colt's armory cutter, as the teeth are stronger both at base and point.

Cross-int. 182. Do you think they are stronger in proportion to their height than in Exhibit Orcutt Cutter?

Ans. I do.

Cross-int. 183. You have spoken of the rankness of cut in the Orcutt cutter in connection with the number of teeth. Do you understand that the rankness of cut of the Orcutt cutter is a constant factor, or that it changes with the wearing away of the teeth? Which is your opinion?

Ans. I think it is a constant factor, because the angle produced by the flat front face and the top face of the teeth is supposed to be preserved throughout the life of the tool.

Cross-int. 184. Take cutters worn away to the extent of that least worn in Defts' Exhibit Worn Cutters, and is the facility for sharpening by grinding the flat front face any different or any greater than that shown in Knights' patent of 1874?

Ans. It is different in this respect from Knights' cutter, in that the Exhibit Worn Cutters shows a facility for sharpening a rand-cutter, bed-cutter, and guard-cutter, while Knights' cutter shows a facility for sharpening only a bed-cutter.

Cross-int. 185. Please reconsider your last answer in connection with the question, and state whether you think (as the question asks) that the facility for sharpening the one cutter is any greater than the other; or is it not this, that you sharpen parts in the one which you do not in the other?

Ans. The difference is that you sharpen parts in the Exhibit Worn Cutters which you do not in the Knights. Of course, there is a little greater facility in sharpening Defts' Exhibit Worn Cutters, because there is more space between the teeth to allow a stronger wheel to be used to sharpen the teeth.

98 Cross-int. 186. Take the Exhibit Old Busell Cutter having twenty-two teeth, and is there or not as great facility for sharpening the flat front face with the emery disk (now put in evidence and marked Defts' Exhibit Emery Disk) as there is in grinding any of the Orcutt cutters?

Ans. Yes; there is as great facility for grinding these teeth in that way.

Cross-int. 187. Have you ever seen disks of this kind used?

Ans. I have.

Cross-int. 188. Are you not aware that they are very generally employed in sharpening rotary cutters?

Ans. I believe they have been since the advent of the Orcutt cutter.

Cross-int. 189. Do you believe that small rotary emery disks and

their use in sharpening rotary cutters came into use at the date of or since Orcutt's invention?

Ans. I believe that emery disks of that form for shoe-trimming cutters came into use since the advent of Orcutt's cutter. Small emery disks for grinding the peripheral edges of shoe-trimming cutters had doubtless been in use for a long time previous.

Cross-int. 190. Do you or not think that before the date of Orcutt's invention cutters embodying the essential features of Brown's patent were made in many hundreds, and probably thousands, of varieties of peripheral faces varying each from the other in greater or less extent, as do the cutters marked Compl'nts' Exhibit Brown & Sharpe Milling Cutter No. 1, Brown & Sharpe Milling Cutter No. 2, Complainants' Exhibit Milling Cutter, Def'ts' Exhibit Colt's Armory Cutter, and Colt's Armory Cutter No. 4?

Ans. I have no doubt of it as metal-cutters to be used in metal-cutting organizations.

Cross-int. 191. In one of your answers you alluded by way of comparison to the gimlet-pointed screw as an instance of invention, but without defining what the invention in that case really was. Please state whether or not it was this, combining with the screw-threaded cylindrical body of the screw a taper point upon which was formed a continuation of the thread upon the main cylindrical body, which thread extended down to the point of the screw. If you answer that this was not the nature of the invention, then please state what you understand it to have been.

99 Ans. Yes; it was. It was the addition in an old well-known form of screw of another old and well-known form of screw (and, when completed, it resulted in the production of a new article with new functions, but which, by a strained construction, some might describe as a screw merely altered in form, but it produced entirely new results, and hence I have no hesitation in calling it an invention of high order).

(Defendants' counsel objects to all of the preceding answer as not warranted by the question and a waste of time.)

Cross-int. 192. Was there not a new result produced by the invention of the gimlet-pointed screw, and was not that new result this—that the thread upon the taper point (when the screw was introduced into the wood) gradually formed in the wood the spiral passage or path for the thread upon the cylindrical body of the screw, and by such gradual forming of the thread path largely reducing the force requisite for driving the screw into the wood?

Ans. Yes, there was a new result produced, because you could turn a screw into wood without boring, where it could not be done with an old flat-pointed screw, and the reasons for it are such as are stated in the question.

(Noon recess.)

Cross-int. 193. In the alleged invention of Orcutt does the front face of the teeth afford any greater facility for sharpening when the teeth are shaped as he shows them than when formed with any other

peripheral shape, and does the front face in connection with the periphery of his cutter produce a new result in the sense that a threaded gimlet point does when combined with the cylindrical body of the screw?

Ans. In the invention of Orcutt the front faces of the teeth afford no greater facility for sharpening than if other peripheral conformation existed upon the top molded face of the blade. The connection of the front flat face to be ground with the top molded surface not to be ground in Orcutt's cutter does produce a new result, in the sense that a new result was produced in combining a gimlet point with a screw, for it made a new article, possessing functions that had never before existed upon the solid blades of rotary trimming tools. In the gimlet-pointed screw the combination of the gimlet point with an old-fashioned screw produced a new article with new functions, and both inventions resemble each other in that respect.

Cross-int. 194. When the threaded gimlet point was used in its original manner—that is, upon the gimlet—the function of the screw was to draw in the other portion of the gimlet, which, by enlarging the hole, entirely cut away the thread formed by the screw point. Was this so or not?

Ans. It was so far as it followed the point.

Cross-int. 195. What do you mean by the words "so far as it followed the point?"

Ans. I mean that the gimlet point was always ahead of the gimlet, and when you had bored in far enough and stopped there was a thread ahead of the gimlet, and when you turned the gimlet back again to draw it out you left a thread in the wood beyond the path cut by the gimlet.

Cross-int. 196. Then we are agreed that to the extent that the body of the gimlet, which is behind its screw point, entered the wood it enlarged the hole and cut away the thread formed by the screw point?

Ans. Yes, it cut the thread away as far as the body of the gimlet went.

Cross-int. 197. While by combining the screw point with the cylindrical-threaded body of the screw the point, as it entered the wood, cut a spiral path or thread, which, instead of being destroyed by the body of the screw, was occupied and utilized thereby. Was this so or not?

Ans. Yes, that is so, and the combination produced a new result.

Cross-int. 198. Can you point out between Orcutt's alleged invention and the state of the art as it existed at that time any such radical dissimilarity of operation, result, function, or product as is agreed to exist between the gimlet point when on the gimlet and when on the end of the screw-threaded cylinder or body of the screw, bearing in mind that what is utilized in the one case is destroyed in the other?

Ans. Two old things were united in a gimlet-pointed screw which produced a new article and new results and an invention, and when

the invention was completed it was a screw changed in form.
101 Orcutt made a trimming tool made up of features taken from different places, and when he finished he had produced a rotary trimming tool which could cut the rand, the bed, and the guard of the edge of a sole. The rand, bed, and guard-cutters were upon a solid blade, which could be ground upon its flat front face without disturbing the top molded surface of the blade. He raked the teeth forward in a manner never before done upon such blades, so far as the records show, and made such angles upon the teeth that they would cut leather in the true mercantile sense, but which would not cut metals, such as steel, wrought and cast iron, in any sense that is legitimate and fair. He made a tool in a manner that was entirely new and which produced results never before attained. If there were principles found in a milling-cutter for steel or iron which he utilized in making up his invention his changes entirely destroyed their effects as legitimate metal-cutters.

(The entire answer is objected to as being labored, argumentative, and not of the concise nature of which the question is susceptible and which it properly requires, because the question admits of a direct answer, yes or no, and no answer is proper except one which is substantially that.)

Cross-int. 199. The question is repeated, with the suggestion to the witness that his opinion is asked as an expert, whether he finds in anything done by Orcutt as an alleged inventor a change as radical in effect as was the change brought about by putting the gimlet point upon the cylindrical wood screw.

Ans. I say, emphatically, that I do.

Cross-int. 200. Does it consist in anything but what is stated in your answer to cross-int. 198?

Ans. It consists in all that I have said, and there are other elements besides, which, to my mind, make still clearer the radical differences which he effected by the changes which he wrought.

Cross-int. 201. Suppose a man, used to making the Brown & Sharpe cutter and other rotary cutters, had, before the invention of Orcutt, been present where a person was operating the Exhibit Thompson Rand and Sole Edge Trimmer, which you have stated would trim the three fundamental divisions of the sole edge—the rand, the bed, and the guard—with which such operator was then trimming sole edges, and he had suggested to the man thus
102 used to making the Brown & Sharpe cutter whether or not a cutter might not be made embodying the essential features of the Brown cutter and which would trim all three of the fundamental divisions of the sole—that is, the rand, bed, and guard—and that thereupon the cutter-maker had gone his way without further conversation or information from the cutter operator or any one else and had produced the cutter described and claimed in Orcutt's patent of 1881, do you or not think that the production of that cutter, after hearing that suggestion, would, in the sense of the patent law, constitute an invention?

Ans. I should say that the suggestion to the Brown & Sharpe man

would have disclosed a remarkably brilliant mechanical mind, and that if the man to whom he made the suggestion had taken the thought and applied his own knowledge of the metal-cutting art with it and had given the amount of study and thought that was necessary to make such a cutter as Orcutt had made that he would have disclosed an intelligence far above that found amongst ordinary workmen, and the united talent of the two men would have produced a dainty and elegant invention entitled to the name of invention in the highest sense.

Cross-int. 202. Your answer entirely evades the question, which is, whether you do or not think that the production of the cutter, after hearing that suggestion, would, in the sense of the patent law, constitute an invention. Please state whether, in your opinion, the production of the Orcutt cutter by a metal-worker, after having heard and only heard the suggestion or query whether or not a cutter could be made embodying the essential features of the Brown patent, which would trim the rand, the bed, and the guard of a shoe sole, would be an invention.

Ans. In that case, if a metal-worker who knew nothing of the leather-trimming art had had merely such a suggestion made to him and had then made such a cutter as Orcutt's, with all the peculiarities which have been described, which made it a leather-trimming instrument, I should say that he disclosed a remarkably brilliant mechanical mind and had produced a novelty with new results, and that he had made a beautiful invention in the highest sense of the term. Whether it would be invention in the sense of the patent law or not I do not undertake to say. It is the province of the Patent Office to determine that.

103 Cross-int. 203. Do you think, as your last answer would seem to imply, that a man's knowledge or ignorance of an art would have anything to do with the question whether or not he has made an invention in connection therewith, or does it depend upon what he has produced as compared with what existed before?

Ans. It would depend upon what he produced as compared with what existed before.

Cross-int. 204. Do you or not think that the conception of the idea by a shoe-trimmer and a suggestion or inquiry based thereon by him, as stated in cross-int. 201, whether a cutter might not be made embodying the features of the Brown patent, but adapted to trim the rand, bed, and guard of a shoe sole, would of itself constitute an invention?

Ans. It would be a large element of invention, and if it had been carried out with all the studied details necessary to complete that thought it would have been a complete invention.

Cross-int. 205. In the case supposed, who do you think would have made the invention, the man who made the suggestion or the man who made the cutter, taking the circumstances as stated?

Ans. I think in justice the credit would have been due to both.

Cross-int. 206. Do you think the suggestion made by the one man

would so far detract from the rights of the other as to prevent his being entitled to a patent?

Ans. That is a difficult question to answer. I think, as a matter of common fairness, that the invention would be due to both.

Cross-int. 207. Do you think there would be any difficulty in making a cutter embodying the essential features of the Brown patent adapted to trim any style of sole edge, even though the person making it had had no experience in making cutters for trimming shoe soles and only experience in making milling-cutters of that class or kind, who was only shown a boot the edge of whose sole the cutter was designed to imitate and had no instructions whatever except as to the size of the hole in the cutter and its diameter?

Ans. I do. Unless the man possessed absolute genius, ranking far above anything common to ordinary workmen, he could not have done it, and the best proof is that Brown's cutter was fifteen years old before anybody who had seen shoe soles trimmed or who had made Brown's cutters ever did it.

104 Cross-int. 208. Then, if I understand you aright, the mere conception of the idea of making a cutter embodying the essential features of the Brown patent and a form and adaption to trim at the same time the three fundamental subdivisions of the edge of the sole would not constitute the only difficulty or exercise of the inventive faculty in producing such a cutter, but it would also be embraced in producing the cutter after the conception had occurred. Is this so or is it not so?

Ans. No; it is not so, and you do not understand me aright. After a conception is formed it may be drawn upon paper or otherwise or so described that a person skilled in the art may carry it out, but it does not fall short of being an invention because it is not carried out.

Cross-int. 209. Do you mean in your last answer to deny the correctness of your answer in cross-int. 202, in which you say in substance that a metal-worker who had heard the suggestion that a metal-cutter might be made in accordance with the Brown patent, and also adapted to trim the three subdivisions of a sole edge, and who should then produce the Orcutt cutter would make a beautiful invention in the highest sense of the term? Please hear cross-int. 202 and its answer read in connection with the last preceding question and answer, and say whether you wish to change either.

Ans. I do not understand this question and therefore cannot answer it.

(Adjourned.)

BOSTON, *Jan.* 31, 1885.

(Counsel present as before.)

Redirect examination by Mr. MAYNADIER:

Int. 210. In view of the metaphysical character of much of the cross-examination, please compare now the leather-working cutters in controversy, taking Exhibits Orcutt Cutter (1st style), Busell Cut-

ter (Orcutt patent of '81), and Defendants' Cutter as representatives, with the milling-cutters, taking Exhibits Brown Patent Gear Cutter, Brown & Sharp Milling Cutter (1 and 2), Milling Cutter, Colt's Armory Cutter, and Colt's Armory Cutter No. 4 as represent-
105 atives, making a close comparison, considering—first, only what would appear on a careful inspection of the things: secondly, considering the mode of operation of the things, and, thirdly, considering the results due to the use of the things, and then state whether they are substantially the same or not, and whether the substantial differences, if there are any, could have been produced by mechanical skill or whether invention was required to produce them.

(Counsel for defendants objects to the question, in that it in fact seeks to reopen the examination-in-chief, which was full, extended, and exhaustive, and that the question is not confined, as it should be, to matters legitimately upon redirect examination.)

Ans. I have examined the exhibits called leather-cutters and the exhibits called milling-cutters, and, comparing them as simple things, without reference to any knowledge of the respective arts of leather-cutting or metal-cutting, I find what are called the leather-cutters have certain peculiarities, as follows: There are blades projecting from the peripheries of cylindrical hubs, and the front faces of the blades rake forward of a radial line in a very marked manner, and there is a sharp angle formed by the front flat faces and the top molded faces of the blades. Upon the top face of the blades there is a certain peculiar configuration, and upon one side of each blade is a very fine, sharp ridge. The blades are thin and set closely together. Upon the milling-cutters there are teeth upon the periphery of a cylindrical hub which have a peculiar configuration of top molded surface, but there are no very sharp, fine ridges like those upon the leather-cutters, unless we except Exhibits Colt's Armory Cutter and Colt's Armory Cutter No. 4, which approach the fineness of the leather-cutters in a certain degree. The front flat faces of the teeth are either nearly coincident with a radial line or rake backwards instead of forwards, as do the leather-cutters, and the angle produced by the front flat face of each tooth and the top molded face of the same is blunt, and the radii of the top molded face are shortened more rapidly than in the leather-cutter. The differences between the leather and the milling structures are very marked, and were I ignorant of the arts of leather and metal cutting I could not say whether those differences were substantial or formal. I should have added that another difference exists, in that the teeth of
106 the milling-cutters are far more widely apart than those upon the leather-cutters.

But knowing, as I do, from study of the leather-cutting art and of the milling art, I am obliged to consider, in getting light upon this subject, the mode of operating the two classes of cutters. The milling-cutters are put into a geared machine and revolved slowly against metal which is firmly held in place in a powerful machine, and the surface of the mills travels against the metal at the rate of

about twenty-five feet per minute, more or less. The leather-cutters are put into a machine which revolves them without gears at a surface speed of over five thousand feet per minute, and the leather is held against these cutters by hand and without any additional machine.

No sane mechanic would for a moment think of making a milling-cutter for metals with the rake of the teeth, the fine cutting angles, and the delicate, sharp ridges shown in the leather-cutters upon a milling-cutter, for he would know that he would produce a cutter utterly worthless (speaking in a practical sense, of course) for cutting steel and wrought or cast iron; and, on the other hand, no sane leather-cutter would employ the milling-cutters in a leather-cutting machine for leather-cutting, for the peculiarities of the tool are such that they could not trim leather in a practical, mercantile sense, although, as a *tour de force*, they might do so in a special instance. The milling-cutters, if put into a leather-trimming machine, could by no possibility cut steel or wrought or cast iron.

The results produced by the milling-cutters and the leather-cutters, cutting metal properly in one case and cutting leather properly in the other case, teach me that the differences between the two classes of tools are substantial and not formal, for each element of difference has a reason for existence in the respective tools. The leather-cutting tool, by the differences which it possesses over the metal-cutting tool and by the different mode in which it is operated, can trim the rand, bed, and guard and the channel guard of a shoe, and the other cannot, and if it were attempted to make one of the milling tools operate as a leather-cutter by changing the rake of the front flat faces of its teeth it will be too rank, while at the same time it would not possess the proper molded surface to trim a rand, bed, guard, and channel guard of a shoe. The rankness of a cut-
107 ter for leather shoe-trimming is made up of several elements: First, by the rake or pitch of the front face of the tooth forward of a radial line; and, second, the angle formed by the flat front face of the tooth and the top molded surface of the tooth; and, thirdly, by the distance of the teeth apart, and the rankness may be varied by shortening or lengthening the radii of the top molded face of the tooth when the tool is constructed.

The differences shown between the metal and the leather cutters here enumerated more firmly convince me that they are substantial and not merely formal. In looking at the results produced, and considering that since Brown's patent of 1864 the highest skilled mechanics in both the leather and metal cutting arts had struggled earnestly to make rotary cutters which could trim all the forms upon a shoe sole as well as was done by the old hand plane, and that at the same time that men had made complicated and expensive machines in the endeavor to employ the old hand plane to accomplish a greater amount of work than the old hand plane could do, and that both the inventors of the rotary tools and the inventors of the last-named machines, although possessing high rank both as mechanics and inventors, had utterly failed to accomplish the results produced by the leather-cutting tool shown in complainants' ex-

hibits, my mind is irresistibly forced to the conclusion that Orcutt, the successful competitor in this race, has made an invention of the highest rank and which the skill of an ordinary mechanic could by no possibility have produced.

Int. 211. Suppose that it became important to use one of the leather-cutting tools as a milling tool for some particular job, how would you go to work to so use it?

(Counsel for defendants objects to the question for the reason that it is entirely theoretical, as it does not appear that the witness ever attempted to use such a cutter for milling metal, and, further, denies the practicability of using leather-cutters for milling metal, and it is an absurdity to ask him how he would use it as a milling-cutter when he says that it is utterly worthless (speaking in a practical sense) as a milling-cutter.)

Ans. If it were to be used, for example, in either soft steel, wrought or cast iron, it would be necessary to bring the work up to
108 the cutter in a regular milling machine with the utmost delicacy, and the metal to be cut would require to be held with absolute solidity. The feed of the metal against the cutter must be such as to enable an infinitesimally small quantity of metal to be removed at each revolution of the cutter, and, in my judgment, it would require an amount of time and an amount of skill, delicacy, and judgment which is not possessed by men ordinarily employed upon milling tools. In my judgment, also, the edge of the cutting tool would be very quickly lost, and the tool would require frequent sharpenings to cut a single piece of work. If it were possible to maintain the fine points of the ridges which constitute the rand-cutters it could only be done by advancing the work so slowly against the cutter that it would occupy an amount of time which would be way beyond anything that is considered practical in the milling art. It would be simply a mechanical feat of the most difficult description and not by any means anything that would be considered practical in a mercantile sense.

Int. 212. Suppose you change the rake of the flat front face and thereby change the angle between the flat front face and the molded top, state whether that would better it any for use as a milling-cutter.

Ans. If the flat front face of the leather-cutter, instead of raking forward as it does, were ground off so as to rake backward of a radial line it would reduce the rankness of the cut in metal and would better it as a metal-cutter to just that extent, but it still would not be a practical metal-cutter in any mercantile sense, but its operation upon metal would be a mechanical feat of a most difficult description.

(Noon recess.)

Recross-examination by Mr. PORTER:

Cross-int. 213. In your last answer, as in numerous others, you speak of rankness of cut in connection with milling-cutters. Do

you consider that term correct in connection with the fact that in milling metal there is a positive relation between the surface speed of the rotating cutter and the automatic advance of the metal which is milled by the cutter? In other words, if the metal being milled advances one-sixteenth of an inch at each revolution of the cutter, the cutter can only cut that much metal in a given time. In this
109 case where is the rankness of cut, and is not the overhang or retiring angle of the front face of the teeth a mere question of their strength and their cutting away of the metal with the exercise of the requisite motive force? Is this so or not?

Ans. The term rankness is often applied to a milling-cutter. While metal is firmly held in the machine in relation to the cutters as described in the question, there is another element that sometimes comes in to produce trouble if the forward pitch of the front flat faces of the teeth is too great. For instance, if a very thin piece of metal is to be milled upon its flat surface and it is held in jaws by its thin edges, if the teeth are hooking there is a tendency to tear the metal out of the jaws; consequently for such work the flat front faces of the teeth are arranged either in coincidence with a radial line or inclined backward from a radial line, so as to tend to push the metal away from the cutter instead of dragging it toward it.

Cross-int. 214. What do you understand by the term "rankness of cut?"

Ans. In that case it would mean hooking under the chip so as to lift the metal out from the jaws of the vice which holds the metal.

Cross-int. 215. If you are milling a thick piece of metal there would be no danger of the teeth hooking under the chip. Is this so or not?

Ans. It is a case of proportionate power. If you grip the metal with more power than the power exerted by the cutter to drag it out of its place there would be no danger its being disturbed. The question of smooth work, however, sometimes comes in, for in the latter case if the teeth were too raking the tool might chatter and produce rough work.

Cross-int. 216. Suppose the Exhibit Brown Patent Gear Cutter was cutting to the full depth of its capacity a groove in a bar of iron four inches thick immovably held in the fixture of a milling machine, would there be any danger of the teeth, however rank, drawing the bar of iron toward itself so as to increase the depth of cut?

Ans. Not if the jaws of the machine were deep enough to so grip the metal as to overcome the power — the milling tool.

Cross-int. 217. Suppose the same cutter to be employed in milling a plate of metal but slightly thicker than the depth of cut made by the cutter, would, in that case, there be any danger of drawing the metal toward the cutter so as to increase its cut?

110 Ans. There would be a tendency to lift it out of place, and the extent to which it would do it would depend upon the size of the plate and the manner in which it was held.

Cross-int. 218. Then you find, as appears from your answers to cross-ints. 213 and 214, in which you define the term "rankness," that the thickness of the metal is the criterion by which to determine the degree of rankness of the cutter. Do you wish to be so understood or not?

Ans. It is one criterion, but it is not all, even if the metal were thick and were so securely held that it would not be dragged out of its place. I have already stated that a tool with the flat front faces of its teeth projecting too far forward of a radial line a chattering or trembling of the tool might occur, which would produce rough work.

Cross-int. 219. You have spoken in numerous instances of the adaptability of Orcutt's cutter to be employed with a rand guide, of the degree of obliquity of the peripheral face of the teeth to a true circle coincident with the cutting edge of the teeth, of the rake of the front faces of the teeth, of the angle resulting from the rake of the front face and the described obliquity of the peripheral faces, of the facility for sharpening by grinding the flat front face without disturbance of the ridges and part which trim the three subdivisions of the sole. Please examine the Exhibit Orcutt Patent of 1879 and state whether or not you find therein these several characteristics in the same degree of clearness that they are shown in his patent of 1881.

(The patent, No. 212,971, to W. D. Orcutt, dated March 4, 1879, is now put in evidence and marked Def'ts' Exhibit Orcutt Patent of 1879, W. A. C., sp'l ex'r.)

Ans. I see no essential difference between the two.

Cross-int. 220. Is or not Bessemer steel as a material for constructing milling tools vastly inferior to the well-known carbonaceous tool steel which may be hardened by the mere agencies of heat and water, while Bessemer steel can only be hardened by the process known as case hardening, requiring the employment of chemicals? Please state whether this is so or not.

Ans. Bessemer steel is an inferior steel to one which may be hardened in water and which will harden through and through,
111 but Bessemer steel may be hardened upon its surface to make a very good tool for temporary service by the case-hardening process.

Cross-int. 221. Suppose a cutter were made of Bessemer steel like or similar to Exhibit Busell Cutter, Orcutt patent of '81, and adapted to trim shoe soles, do you believe that such a cutter could be employed to cut the ends of steel bars of high quality by dozens or scores to serve, when hardened, as shaping tools to form other rotary cutters like said Exhibit Busell Cutter, Orcutt patent of '81, bearing in mind that said bars, to serve as shaping tools, must be cut in a perfect manner?

Ans. I believe the Bessemer tool, properly case-hardened, would cut as well for a temporary purpose as a steel tool, but I do not believe that either of the two—Bessemer or ordinary steel—when left in a condition to trim shoes would mill steel bars in any sense which

is employed amongst those habituated to use milling-cutters upon metal. I have said over and over that while a mechanical feat is possible it is not practical in a mercantile sense. If the trimming tools had the front flat faces of their teeth altered and raked back like a metal-cutter, then they might operate in a certain fashion to cut steel as indicated, because they had ceased to be leather-trimming tools as practically and generally used, and had become very inferior milling tools—that is to say, tools requiring extreme skill and care in their use and which could in nowise compete in quantity of work produced with milling tools as practically and generally used for the same purpose and with the same skill. It would be a forced and abnormal business.

Cross-int. 222. In your first redirect answer you spoke particularly of the rake or overhang of the front face of the teeth; please examine the Exhibit Tayman Patent of 1873 and its reissue of 1880 and state whether or not it exhibits the same characteristics and to an equal degree.

Ans. In the Tayman patent and reissue there is an overhanging front flat face [but it is not in connection with a top molded surface which is not to be ground. It is upon a burr-cutter, and it is also upon a burr-cutter which can trim only two of the three fundamental forms upon a shoe-sole edge, while the projecting front flat face of the tooth of the Orcutt patent of 1881 is in connection
112 with the top molded face of a tool which can trim the three fundamental cuts of a sole with their subdivisions].

(All of the preceding answer included in brackets objected to as not called for by the question and argumentative.)

Cross-int. 223. Does or not the overhang of the teeth perform the same function *per se* whether the teeth are like those shown in the Orcutt patent or in the Tayman patent, and whether more or less parts of the edge are being formed?

Ans. It does as far as it goes.

Cross-int. 224. In your first redirect answer you spoke of the fact that the obliquity of the peripheral face of the teeth to a true circle was less in the Orcutt patent than in the Brown patent, while the overhang or rake of the front face was greater in Orcutt's. Do you think that in rotary cutters for trimming shoe soles the decrease of the overhang would be compensated for by the greater obliquity or freeing of the peripheral face if the same angle between the face and the periphery was maintained?

Ans. No; I do not.

Cross-int. 225. Do you or not think that it would be practical to trim shoe soles in a mercantile manner, as you term it, or with practical despatch and good finish with a cutter in which the front faces of the teeth incline back of a radial line, provided the peripheral or top face was sufficiently inclined to give the required acuteness of angle at the cutting edge?

Ans. No; I should think not.

(Adjourned.)

BOSTON, *Feb.* 3, 1885.

(Counsel present as before.)

Cross-int. 226. In one of your answers to a redirect question you spoke of the high velocity at which complainants' cutter is revolved when in use. Do you find that the velocity varies from that previously given to other rotary cutters for use for the same purpose?

Ans. No; I do not. I should think that all leather-cutters would revolve at about the same velocity.

Cross-int. 227. Do you think in view of the velocity given to other cutters before Orcutt's that the velocity given to his has any-
113 thing whatever to do with the question of whether it is or is not an invention within the proper meaning of that term? If your answer is yes, please state your reasons therefor.

Ans. It has this to do with it, as I see it: It is one of the elements which go to show the difference in mode of using the thing between it and the mode of using another thing with which it is compared to establish the fact whether the compared tools are different from each other, and it is an important factor in making up a judgment as to whether two things are the same or whether they differ from each other in nature, as, for instance, in comparing a leather-cutting tool with a metal-cutting tool. To determine whether two tools are alike or different from each other I am obliged to regard their forms, their modes of operation, and their results, and if I find that one of them in these particulars is unlike anything hitherto found I am obliged to consider it novel, and if the novelty, in my judgment, required the amount of thought, ingenuity, and study which I believe to be invention I made up my judgment to that effect.

Cross-int. 228. Take the case of a "paring" or firmer chisel which may be used in the more common way, when held in the hands of the operator, of moving it against the wood and thereby cutting the same, or may be used, as it quite frequently is, to cut the wood when the latter is revolved at a high velocity in a lathe, the chisel being supported upon the lathe rest and not advanced toward the wood. Does such changed use of the chisel in any manner or in any degree change its character as a tool?

Ans. It does not change the character of the tool in that case, but it is an entirely different mode of using it. It is an improper use of the tool, for while it may cut wood in a certain fashion it requires a differently constructed tool to do rapid and good work such as is done by a skillful turner with a proper instrument.

Cross-int. 229. Do you or not think that the velocity given to Orcutt's cutter constitutes any element of novelty therein?

Ans. I do, as compared with metal-cutters.

Cross-int. 230. Please answer the preceding question in the relation in which it is asked and without importing into the answer any element not responsive thereto.

Ans. I have answered it exactly as I understand the question.

114 Cross-int. 231. Do you think that the question of the speed of Orcutt's cutter was an element of his invention?

Ans. It depends entirely upon what it is compared with. If with metal-cutters, yes; if with leather-cutters, no.

Cross-int. 232. You have testified to your knowledge of the arts of leather and metal working and to your experience as an expert in patent cases. Will you now answer directly and without introducing qualifications whether you think that the question of the speed at which Orcutt's cutter is properly revolved when in use constitutes an element of his invention?

Ans. Answering the question without qualification or explanation, and considering only the mere revolution of Orcutt's cutters at the speed usual with leather-cutters, *per se*, of course that alone would not be invention.

Cross-int. 233. Please examine the cutter marked Compl'nts' Exhibit Corthell Patent Cutter (pat. No. 207,395) in connection with the drawings in complainants' patent in suit and state whether or not you find any material difference in the rake or overhang of the front face of the teeth, and if you think you do please state how many degrees of difference you find and in which is the excess.

Ans. I do find a material difierence between the Corthell patent cutter and the cutter in complainants' patent in respect to the inclination of the front faces of the teeth. The variation is very marked. The inclination of the Corthell cutter teeth, of the rand, the bed, and the guard of the cutter seem to me to incline back from a radial line. The rand-cutter, especially, inclines very much back of a radial line instead of projecting forward as in the Orcutt cutter. How many degrees the teeth in the respective cutters vary from each other in their inclination I am unable to state in the absence of means for accurate measurement.

Cross-int. 234. Is or not the increase of the obliquity of the top face of the Corthell teeth from a true circle much greater than in the Orcutt patent or Orcutt cutter?

Ans. It is very much greater.

Cross-int. 235. What, in your judgment, would be the quality of the work performed by the Corthell cutter in trimming sole edges and what would be the rapidity of its execution of such work, comparing it in both these respects with the Orcutt patent?

115 Ans. The backward inclination of the front face of the teeth, instead of a pronounced forward inclination of the front face of the teeth, as in Orcutt's cutter, would tend to make a scraper rather than a cutter, and there would be more of a tendency to heat the cutter and to burn the leather in removing the surface of the latter than in the case of the Orcutt cutter, which makes a clean cut instead of a partial frictional removal of the leather. I should say that the work produced by the Orcutt cutter would be cleaner and smoother than with the Corthell, and that the tool would wear better.

Cross-int. 236. Should you say that good work could or not be executed with reasonable rapidity with Exhibit Corthell Patent Cutter?

Ans. I should think it could, but I should think that the work of the Orcutt cutter would be much better.

Cross-int. 237. Much has been said during your examination in regard to the rake of the teeth in the Orcutt cutter and its increased efficiency on that account. Please consider the obtuseness of angle between the front and top face of Orcutt's cutter as compared with that in the teeth of the hand cutting tools, and state whether any advantages are secured in that behalf by the Orcutt cutter that are not apparent in the hand cutters.

Ans. The angle produced by the flat front face and the molded surface of the hand cutter marked Exhibit Snell & Atherton Cutter is more acute than that upon the Orcutt cutter, and the inclination of the flat front face of the teeth of the hand cutter forward of a radial line is greater than in the Orcutt cutter. The angle and the forward projection of the teeth in the hand tool are proper in a hand tool which moves at such a slow surface velocity over the leather, but in my judgment the inclination and angle of those teeth would be improper upon the teeth of Orcutt's rotary cutter with its enormously increased surface velocity over the leather, as it would make the tool too rank and would tend to snatch the shoe from the hand of the operator or possibly ruin the work.

Cross-int. 238. Then you think the rake of the teeth in the Orcutt cutter is greater than in the Exhibit Corthell Patent of 1878 and his Exhibit Cutter, but is less than in the Exhibit Hand Tools. Is this your meaning?

Ans. Yes; it is.

116 Cross-int. 239. In the construction of the Orcutt cutter in a proper manner—that is, in the *modus operandi* and tools employed in making that cutter—is there necessarily or in fact anything essentially different from what would be required in making the cutter shown in Exhibit Brown Patent of 1864, with the single exception that the tool which molded the peripheral face would require the configuration shown in the Exhibit Snell & Atherton Hand Tools?

Ans. I should think the *modus operandi* of making the cutters would be substantially the same, except that in case of the Brown & Sharpe cutter the mode of backing off the teeth might vary from that of backing off the teeth of the Orcutt cutter, as the teeth of the latter are so much thinner and more delicate than those of Brown & Sharpe.

Cross-int. 240. Do you mean by "backing off," as referred to in your last answer, anything more than that a lighter or heavier chip might be taken in one case than in the other?

Ans. That is all, except that there might be more risk of loss of cutters by breaking the fine points in backing off the Orcutt teeth by the means employed upon metal-cutters than there would by producing the backing off in some better way.

Cross-int. 241. Which is the greater, in your opinion, the rake of the flat front face of the teeth shown in the complainants' patent or in the Complainants' Exhibit Busell Cutters (Orcutt patent of '81)?

Ans. It is rather difficult to determine, as the drawings are made in perspective.

Cross-int. 242. Does not the drawing furnish you with the requisite facilities or information for making the comparison?

Ans. There is a variety of angles shown in the drawing, and I could only judge approximately; therefore I can only speak approximately. I should say that there is no substantial difference that the eye could distinguish between the drawings and the cutter in respect of angles.

Cross-int. 243. In one of your earlier answers you spoke, by way of comparison, when referring to Orcutt's alleged invention, in relation to the combination, in a steam-engine, of a throttle or stop valve independent of the steam-governor with another valve under the control of the governor, or to that effect. Was that the essential invention in the steam-engine which you intended to state? If not, please describe it as you intended to when you instituted the comparison.

117 Ans. I understood the gist of the invention to be a new combination of two old, well-known things, namely, the governor was old and well known, and a steam-valve as such was old, and the governor, instead of being attached to the throttle-valve of the steam-pipe, as it always had been, was disconnected, and was attached directly to the operative mechanism of the steam-valve of the engine.

(Noon recess.)

Cross-int. 244. That is, in addition to the throttle-valve which formerly admitted steam to the engine, the inventor added another valve and transferred the governor and its operation from the old throttle-valve (which he still retained) to the new valve thus added. Is this so or not?

Ans. No; he did nothing of the kind. He did away with the valve in the steam-pipe with which the governor was connected, and connected the governor with the operating mechanism of the steam-valves which admitted steam to each end of the cylinder, and he retained in the steam-pipe only the "stop-valve" which exists to-day, and has nothing to do with what we were talking about.

Cross-int. 245. Please refer to your answer to Int. 7, where you institute a comparison involving what you term the Corliss invention, and state whether you there wish to be understood as defining Corliss's invention to be this: that he left the throttle-valve in the pipe as before, but disconnected or separated the regulator therefrom and applied it by means of newly invented devices to the valve in the engine, which admit steam alternately to the different ends of the cylinder. Is this so or not?

Ans. No; I do not mean so. In the old-fashioned engine pipe there was a throttle-valve next the engine, to which the regulator was connected, which strangled the steam as it closed to afford a diminished supply to the engine, and opened to give an increased supply according as the governor acted upon it. In the steam-pipe farther from the engine there was in addition a hand stop-valve, as it was called, which admitted the steam from the boiler to flow through the pipe to the engine. The throttle-valve which was con-

nected to the governor at that time was abandoned. When the governor was connected directly with the induction valves of the engine cylinder by Corliss the hand stop-valve still remained
118 and is in use upon all engines to-day, and possesses the same functions it had since engines were first introduced.

Cross-int. 246. But does the governor perform its office in the same manner as before Corliss changed the governor from the throttle-valve to the valves that admit steam alternately to the different ends of the cylinder?

Ans. Not in the same manner.

Cross-int. 247. Was not the change this, that the governor, when attached in the old-fashioned way to the throttle-valve only varied the flow of steam to the cylinder as the load imposed upon the engine was varied, while as arranged by Corliss the flow of steam into the cylinder was limited in duration, and his valve arrangement shut it off when but a partial stroke had been made in order to allow the steam to expand in the cylinder?

Ans. That describes it somewhat in detail, but the functions of the old devices and the new were to regulate the flow of steam to the engine cylinder as the load varied. The old was a roundabout process and the new was direct.

Cross int. 248. While "the old devices and the new were to regulate the flow of steam to the engine cylinder as the load varied," as stated in your last answer, was not this new result produced, that whether the load upon the engine were light or heavy, in so long as it was below its maximum capacity, the flow of steam into the cylinder would be checked at every stroke when the stroke was but partially completed, and was not this a new result which the old did not accomplish?

Ans. The intention of the old device was to accomplish the same thing, but the means were not good enough to do it. The new means were better and did accomplish it. The old means were like trying to stop a man from kicking by choking him. After awhile he would stop. The new means stopped him from kicking by directly seizing his foot, thereby producing an instantaneous effect.

Cross-int. 249. But was there not this other difference, that in the old, whether the valve controlled by the governor was wide open or but partially open (as the speed of the engine allowed), the flow and pressure of steam would be constant in the cylinder as long as the load upon the engine was unchanged, while in Corliss the
119 flow of steam was shut off when the cylinder was but partially filled—that is, when the piston had made but a fraction of its stroke, and the balance of the stroke was effected by the expansion of the steam thus imprisoned and isolated in the cylinder, and with no further effect from the boiler pressure?

Ans. The flow and pressure of steam would be constant in the old-fashioned engine as long as the load was constant, but in the Corliss engine a new result was produced, as stated in the question.

JOHN A. COLEMAN.

Attest: WM. A. COPELAND,
Special Examiner.

BOSTON, *Feb.* 4, 1885.

Present: J. E. Maynadier, Esq., of counsel for complainants; T. W. Porter, Esq., of counsel for complainants.

Deposition of F. W. Coy.

Direct examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Frederick W. Coy; 44; Boston; mechanical draughtsman.

Int. 2. What experience have you had in matters mechanical, especially as relating to shoe machinery and also as an expert witness?

Ans. My experience as a mechanic has been about 25 years, and upon shoe machinery more particularly during the last 10 or 12 years. My experience in shoe machinery has been principally in that class of machinery known as edge-trimming and edge-setting machines. I have acted as an expert in patent cases on several occasions during the last three years.

Int. 3. If you ever attempted to construct a machine for trimming sole edges state when first, with the circumstances, and what sort of a machine it was generally and how far you got.

Ans. My first attempt to construct a machine for trimming
120 the edges of soles of boots and shoes was about 1872; in the early part of 1872. At that time I received a rough drawing from Geo. A. Fullerton, which embodied his ideas for the construction of a machine which should be automatic in all its movements, and was that class of machine known as the "straight-knife machine." Its construction was as follows: The shoe was placed upon a jack which was mounted upon suitable guides, and was capable of making an alternate sliding and half-round movement, suitable means being provided whereby the sliding movement of the jack might be adjusted to conform to the varying length of the shoes to be trimmed. The knife, which was a straight one, was mounted upon suitable guides and bearings, which were operated by suitable cams and levers, by which the knife was caused to follow the varying curves and bevels of the shoe sole while it was being moved along against the knife.

The drawings and patterns were made by me. The castings, nearly all, were got and the machine completed to a sufficient extent to convince those interested that there were difficulties in the principle that could not at that time nor with that design of machine be overcome, and it was therefore abandoned. I think the time occupied, so far as we got, about six or eight months.

Int. 4. When next did you make an attempt to make such a machine? And please describe the machine generally and state the circumstances and how far you then got.

(Objected to on the score of waste of time, for the reasons that draw-cut machines, in regard to which the previous question was directed as well as the present, is no way analogous to the invention

in controversy, and it is immaterial as to what efforts this witness has made to construct a draw-cut machine, entirely irrelevant except as showing the qualifications of the witness as an expert, and for that purpose the question should not be put in present form, as there is no occasion for his describing the character and details of the various machines on which he has expended time.)

Ans. My next attempt was in 1875, when I was employed by the same party, Mr. Fullerton, to redesign a machine for trimming, using such parts of the previous one as were considered of value; but this machine was not to be automatic, so far as the movement of the tool was concerned. I therefore went to work and constructed
121 a full-size model, principally of wood. After experimenting upon this model for several months it was decided to make a set of drawings and patterns to construct a machine upon the plans adopted in the model. After this third machine was completed and reconstructed in a great many respects we met with only partial success.

There were then other suggestions made by which the difficulties we have met with might be overcome, and after experimenting for some time in models it was decided to redesign the machine and adopt the new features which we had found, which we proceeded to do; but after the last machine was completed, although we had made great advances in the art of trimming sole edges, it was not considered a practical machine on account of its great complication, and was therefore abandoned about the year 1880 or 1881.

Int. 5. What was the state of the art when you commenced, in 1875—that is, how were sole edges trimmed generally, and what was the saving which could be made?

Ans. At that time soles were trimmed almost exclusively by hand knife and hand plane. The prices that were paid at that time for trimming I have no knowledge of, but it was estimated by those for whom I was at work on machines for that purpose that there would be a saving of one to one and a half cents a pair.

Int. 6. During the time you were occupied in constructing the machines for trimming sole edges was your attention ever called to the likelihood or possibility that rotary trimming machines might supersede the hand plane and machines of the kind you were building? If so, state what you did, and state also what your opinion was in 1879 or 1880 as to rotary trimming machines.

(Objected to as being entirely immaterial what this witness's opinion might have been in 1879 or 1880 or any other time except the present or what suggestions might have been made to him about the possibilities or probabilities of one machine or another.)

Ans. During the last two or three years of the time in which I was employed on those trimming machines my attention was called to the rotary trimming machines, and in the year 1878 or 1879 I made some investigations and inquiry in regard to the excellence of work which the rotary cutter was capable of doing. My investiga-

tions were made principally in New York State, where I was
122 sent for the purpose of investigating rotary trimming. After making as full investigation as I could I found that the cutter then used was not capable of doing satisfactory work on account of the tendency to burn or harden the leather. It was therefore my opinion, which I expressed to those who sent me to investigate, that the rotary cutter was incapable of doing good work.

Int. 7. What was your opinion as to rotary trimming about the time you ceased finally to work on the class of machines about which you have testified and what is it now, and what caused the change, if there was a change?

(Same objection.)

Ans. About the time I stopped working on the trimming machines I was convinced that there had been great advances made in the art of trimming sole edges with a rotary cutter, not only so far as the quality but the quantity of work done, and also the simplicity of the machine by which the cutter was operated. The complication of the machine upon which I had been at work convinced me that we could not successfully compete against a rotary machine, particularly in the quantity of the work done, and that is my opinion at the present time, only somewhat strengthened from subsequent developments.

Int. 8. To what do you refer by "great advances" in your last answer?

Ans. I refer to the construction of the rotary tool known as the Orcutt cutter, and also the increased capabilities of the operators in using these machines.

Int. 9. In the manufacture of the sole-trimming machines upon which you were at work prior to 1881 did you have occasion to use rotary milling tools? If so, state how they resemble in substance those now before you, Exhibits Milling Cutter, Brown & Sharpe Milling Cutters 1 and 2, Colt's Armory Cutter and Colt's Armory Cutter No. 4, and Brown Patent Gear Cutter.

Ans. I had occasion to use such cutters as those referred to in the question, which in some cases would be exactly the same as Exhibit Brown Patent Gear Cutter.

Those cutters which I used are the same in substance as the exhibits, in so much that they were constructed with a short, stout tooth, the front or flat face of the tooth standing at an in-
123 cline in front of a radial line drawn from the cutting edge of the tooth. The tooth is given a clearance by cutting away the material behind the cutting edge, all that is necessary consistent with the strength of the tooth, which is the general plan in all burr or milling cutters.

Int. 10. Now, please compare the cutters now shown you—Exhibits Orcutt Cutter, 1st style; Busell Cutter (Orcutt patent of 1881), and Defendants' Cutters—with the milling-cutters—Exhibits Milling Cutter, Brown & Sharpe Milling Cutters 1 and 2, Colt's Armory Cutter and Colt's Armory Cutter No. 4, and Brown Patent Gear

Cutter—and state whether the sole-edge trimmers are substantially the same or not as the mills, giving your reasons.

Ans. In examining the cutters referred to known as sole-edge cutters I find they differ from those known as milling-cutters in the following particulars: First, the incline of the front face of the tooth in relation to a radial line from the cutting edge of the same is the reverse from what it is in the milling-cutters, thus giving a hook form to the tooth, which would tend to draw the material being operated upon toward the cutter instead of throwing it off, as would be the case in the milling-cutter; second, the angle of the top face of the tooth is different from that of the milling-cutter in certain respects; third, the distance between the cutting edges of the teeth and the angle of the top face of the tooth in relation to the front face are so proportioned as to prevent a gouging tendency of the tool upon the material operated upon when that material is presented by the hand, as is the case of shoe-trimming of this class. For these reasons I do not think these cutters for trimming are substantially the same as those for milling.

Int. 11. How does the mode of operation of the rotary sole-edge trimmers resemble or differ from that of the milling-cutters?

Ans. The mode of operation of the milling-cutter is upon a material which is securely fastened to a table capable of being moved in all directions in relation to the milling tool, and therefore the depth or rankness of the cut is determined by the adjustment of the table to or from the cutter or in other directions in some cases, while in the trimming-cutter the material to be operated upon is brought in contact with the cutter by the hand and not upon any fixed
124 guides, as is the case in the milling machine. It will therefore be clear that the rankness or depth of the cut depends upon the proper forming and proportioning of the teeth, not only the front flat face, but the angle of the top of the face in relation thereto and the distance between the cutting edges of the teeth.

There is also a difference in the mode of operating these two cutters, which is one of speed; in the case of the milling-cutter the speed being very slow, probably not more than from 100 to 300 revolutions per minute, while in the trimming-cutter the speed is estimated at from 7,000 to 8,000 revolutions per minute.

(This question and answer and all like it are objected to because the essential features of the cutter in controversy are not changed by the kind of machine in which they are used or the velocity at which they are revolved or the material on which they are employed; that the variations of rotary velocity of cutters when cutting different kinds of material have been long well known; that the method of trimming shoe soles while held in the hand and metal while held in a fixture are equally well known, and that it is entirely foreign to the questions in this case as to what a cutter may be employed for or in what way it is employed, and therefore a waste of time to raise the questions involved in the preceding question and answer.)

Int. 12. In your opinion is there invention or not in the produc-

tion of these rotary sole-edge trimmers, assuming, of course, full knowledge of the rotary milling-cutters and the old style of rotary sole-edge trimmer? And give your reasons for any opinion you may express.

(Objected to as being a question for the court and not for the witness.)

Ans. In my opinion there is an invention in the Orcutt cutter which is used for trimming sole edges, and my reason for my opinion in this connection is that it is the first rotary cutter in which the necessary guard or gauge for the rankness or depth of cut is in the tooth itself—that is, that part of the tooth directly behind the cutting edge, which is not only a guard for the depth of the cut of its own cutting edge, but also gauges the depth of the tooth which follows it; and also the angle of the front face of the tooth in relation to a radial line from its cutting edge is such in proportion to the other forming of the tooth as to tend to remove the chip in the
125 form of a slice, rather than any powdered or pulverized form, as would be the case were the flat front face not so arranged.

(Noon recess.)

Int. 13. Did it ever occur to you while you were engaged in making the machine to supersede the hand plane that the very milling tools that you used in making parts of that machine could be used for sole-edge trimming or could be so modified as to be adapted to that use? If not, please state how you account for it.

(Objected to as entirely immaterial, for, although ninety-nine men may fail to recognize a new use or adaptation of a tool and the hundredth man does recognize such new use or adaptation, it in no sense follows that he has made an invention.)

Ans. Although I have used milling-cutters in the case referred to in the question and previous to that time, it never occurred to me that a rotary cutter, such as I had used, could, as then constructed, be used or so modified as to be used unless the material to be operated upon was guided in some other way than by the unaided hands.

My reasons for this statement are that it never occurred to me that a rotary tool could be such and at the same time act as a guard or guide for the depth of cut which it might take in the material operated upon and produce smooth surface. I mean by "smooth surface" not wavy in the sense in which a rotary milling-cutter would make it, such as I was accustomed to use in my experience as a machinist, if the material was presented by the unaided hand.

Cross-examination by T. W. PORTER, Esq., of counsel for defendants:

Cross-int. 14. You have spoken of your having abandoned work on edge-trimming machines which you termed complicated by reason of the "great advances made in the art of trimming sole edges with rotary cutters," and have instanced Orcutt's cutter in your answer to Int. 8 as such rotary cutter. Do you or not know of the suc-

cessful use of other rotary cutters for trimming sole edges before the introduction of Orcutt's cutter? If so, please specify such cutters.

Ans. I never knew of an instance in my inquiries and investigations of the art of trimming sole edges where the machine gave perfect satisfaction or even approached that point previous to the time that the cutter called Orcutt cutter was introduced. The
126 difficulty, as explained to me, of rotary trimming-cutters previous to Orcutt's invention was the difficulty in getting the proper form for the edge, and also the means of sharpening the cutter. As a consequence, although they were used in certain cases, yet the tendency of the cutter was to harden or burn the leather, particularly if the cutters were not kept sharp, and as a consequence the process of burnishing the edge was much more expensive when trimmed in that way than if trimmed with the hand tool. This was particularly the case in the better class of work, where it required not only a fancy edge, but also required that it should be well burnished.

(Answer objected to, as it does not answer the question.)

Cross-int. 15. The question is repeated, with a request that the witness shall bear in mind that he is therein requested to state whether he does or does not know of the successful use of other rotary cutters (than Orcutt's) for trimming sole edges before the introduction of Orcutt's cutter.

(Int. 14 re-read.)

Ans. I know there were other rotary cutters in use for the purpose specified in the question previous to the introduction of the Orcutt cutter. Among them was the cutter known as the Busell and others, but that they were successful in their operation or gave satisfactory results I deny.

Cross-int. 16. Do you know whether any other class of rotary cutter is now employed in trimming shoe soles except the Orcutt?

Ans. I do not know from positive knowledge that other rotary cutters not embracing the invention of Orcutt are not in use [but, if so, I believe they are employed on but an inferior class of work and entailing greater expense in burnishing the edge of the sole].

(All that part of the answer in brackets objected to as not called for by the question.)

Cross-int. 17. What is your belief from your knowledge that other cutters than Orcutt's and which were earlier in the field than Orcutt's have or not been in use in this State up to the present year?

Ans. I believe such a thing is possible, and I have no doubt that such is the fact.

Cross-int. 18. What cutter do you refer to in your last answer?

Ans. I refer to the Busell cutter, it being the only one, according to my recollection, that I have seen in use except the one known as Orcutt's.

127 Cross-int. 19. If the Busell cutter was earlier in the field, as you admit, than Orcutt's and has continued in use, as you

say you believe, up to the present year, and yet would not trim sole edges successfully, as you state in your answer to cross-int. 15, how do you reconcile the state of facts? Do you think manufacturers have continued to use an unsuccessful trimming tool from before the introduction of Orcutt's up to the present year?

Ans. I have no doubt, from my experience with manufacturers and others, that it is possible that they should continue to use an inferior tool, even after the introduction of a better one, through ignorance on their part as to the comparative merits of the two tools. This I know to be the case in other business, and I have no reason to suppose that such is not the case in the instance cited. It may be that they can get them cheaper or that they had a large stock on hand of that particular tool, and, not desiring to lose those they already had, have continued to use them in spite of the fact that they could not produce so perfect a result as they otherwise might. This, I think, is a fair conclusion and a proper solution of the question.

Cross-int. 20. Do you think the operatives who run these trimming-cutters are capable of judging which is the more successful—the Busell or the Orcutt?

Ans. I think they are in most cases, but if they have not had the opportunity by trial of different cutters I do not think they are sufficiently skilled in the construction of cutting tools to be able to judge of the comparative merits of such tools without a practical trial.

Cross-int. 21. When did the Orcutt cutter go into use in this State?

Ans. I cannot speak positively upon that point, but I should think about four or five years ago.

Cross-int. 22. Do you think it has been extensively used in this State?

Ans. I think it has, considering that it is a comparatively new invention.

Cross-int. 23. To what extent do you think it has driven out other rotary cutters that preceded it?

Ans. I have no means of speaking positively on that point, but if I may judge by their comparative merits, according to my
128 own estimation of such merit, I have no doubt they have taken the place of the Busell cutter to a very large extent.

Cross-int. 24. Do you know that the same machine may be employed so as to use either the Orcutt or the Busell cutter, the only change requisite being the holder which is secured in the arbor of the machine?

Ans. I presume that is the fact, so far as the rotary cutter is concerned. There may be some changes necessary in respect to making different forms of edges, but even this I am not prepared to state positively about.

Cross-int. 25. Are you aware that the Busell Company have in all the editions of their calalogue shown illustrations of and advertised the old Busell cutter?

Ans. I am not aware that they have or have not done so.

Cross-int. 26. From your knowledge of this art, and as a manufacturer, do you think they would have been likely to have kept up their illustrations and advertising of the old Busell cutter in their catalogue if there had not been a demand for it?

Ans. Speaking from a business point of view, I should not think they would do so.

Cross-int. 27. Have you heard of the pending strike among shoe-edge trimmers in the town of Marlboro', in this State? If yea, please state whether you know or have heard that the edge-trimmers there have struck because the manufacturers, since the Busell Company have reduced the price of cutters from three dollars to one, have changed from the old Busell cutter to the Orcutt cutter, and that the workmen demand more per pair for trimming because they cannot trim as many pairs with the Orcutt cutter as with the Busell cutter, which advance in prices the manufacturers refuse to concede.

Ans. I have no knowledge whatever of any such state of affairs as cited in your question.

Cross-int. 28. You instance as one of the reasons why manufacturers may have continued to use the old Busell cutter since the introduction of Orcutt's that they might have had a stock on hand which led them so to do. Do you think shoe manufacturers are likely to buy up shoe-trimming cutters sufficient to last them for several years?

Ans. I don't think they are likely to do so, but if they had
129 some on hand of the old kind I think they would be likely to use them, unless they saw it was for their advantage to change to some other cutter.

Cross-int. 29. You have spoken in your direct examination of the incline forward of the teeth in the Orcutt cutter, thus giving it a hook form, as you term it. Do you find any difference in that respect between the teeth of Orcutt's cutter and the teeth of the hand tools, Snell & Atherton cutter and Snell and Atherton cutter No. 2, now shown you? If you think you do, please specify wherein you think the difference consists.

Ans. There is no particular difference in that respect, except, perhaps, the degree of that angle in relation to the top of the tooth.

Cross-int. 30. Do you regard the incline of the front of the tooth in a rotary cutter in order to give it a hook form, as you term it, as indispensable in such a cutter in order to successfully trim shoe soles?

Ans. I regard it as indispensable where it is desired to get the greatest degree of perfection of work; and I would add farther that the amount of hook or angle of the front face is also a necessary point in such perfection of execution.

Cross-int. 31. What is your opinion of the cutter now shown you, marked Exhibit Old Busell Cutter? Do you think it would trim a sole edge good, bad, or indifferent?

Ans. I think it would be indifferently well; half way between bad and good.

Cross-int. 32. What are your reasons for the opinion last given?

Ans. Because there is no guide to regulate the rankness of the cut, and also because it is inconvenient to sharpen and is not designed for any other form of edge than what is termed a plain edge; neither has it any facilities for bringing the edge of the sole to a parallel thickness.

Cross-int. 33. What do you mean by the word "guide" in your last answer?

Ans. I mean that part of the cutter which is directly behind and extending to the heel of the cutter and so formed as to prevent the hook form of the flat front face from drawing the material any nearer to the cutter than is necessary to get a sufficient depth of cut.

Cross-int. 34. Do you think the top face of the tooth in
130 the Orcutt cutter and the incline of the same from the front to the rear of the tooth actually serves as a guard or guide, as you call it, to govern the depth of the cut in the sole edge when trimming it?

Ans. I think those two elements named in your question and the third one, which is the distance between the cutting edges, taken together, form such guides, if the angle of the flat front face and the top of the tooth is preserved as shown in the Orcutt cutter.

Cross-int. 35. Take cutters like Complainants' Exhibit Busell Cutter (Orcutt patent of '81) and use them in the usual manner until they reach the condition of Defendants' Exhibit Worn Cutters. Would the depth of cut, governed as you have described, be increased or decreased?

Ans. The depth of cut would be slightly increased.

Cross-int. 36. Do you think that an experienced trimmer using cutters like Busell cutter (Orcutt patent of '81) can increase or decrease the depth of cut at will by simply regulating the pressure that he exerts upon the shoe in bearing it against the teeth upon the cutter—that is, he can make it twice as much at one time as another if he sees fit?

Ans. I don't think he can make it as much as described in the question. The increased depth which might be got by different pressures would vary greatly in proportion to the condition of the cutter, whether it be a new cutter or an old one, and also by the kind of stock being cut, as well as the rapidity with which the shoe was moved during such operation.

Cross-int. 37. Take cutters like Exhibit Worn Cutters, and do you or not think the operator could vary the depth of cut at least one-half by varying the pressure upon the shoe?

Ans. I think he could if he was trimming soft stock; but the variation would depend somewhat upon the condition of the stock.

Cross-int. 38. Do you not think that an operator can take either the Exhibit Busell Cutter (Orcutt patent of '81) or Defendants' Exhibit Worn Cutters and by pressure upon the shoe against the cutter and without moving the shoe along over the cutter he could cut directly down into the sole half the diameter of the cutter or more if he saw fit?

Ans. I think he could do so.

131 Cross-int. 39. Please compare the Exhibit Old Busell Cutter with Defendants' Exhibit Worn Cutters and state whether or not you think the guard upon the outer face of the tooth is not as great in the Busell cutter as in the Orcutt worn cutters, and in answering this have reference to the relative distance between the teeth in the two exhibits.

Ans. I find in the old Busell cutter that although the thickness of the top of the blade—that is, the width of the top face of the cutter—is equal to that of the worn cutters, which are so nearly worn out as to make them of no practical value in doing good trimming, yet the angle of the top face of the worn cutter with the flat front face is preserved, as in the new cutter of the same make, and consequently is better adapted as a guard for the rankness of the cut than is the old Busell cutter, from the fact that the Busell cutter is ground upon that part which acts as a guard for the rankness of cut, and consequently the eccentric form in relation to the center of the cutter cannot be preserved with that accuracy that is necessary for a proper trimming tool.

Cross-int. 40. Please examine said worn cutters and state whether the angle between the front face and top face is alike in all of them or is in either of them like that in Busell cutter (Orcutt patent of '81).

Ans. I don't think they are alike on all of them as regards the angle referred to in your question, and that is why I stated that they are unfit to perform proper work; but the angle of the top face of the cutter in relation to a radial line from the cutting edge of said cutter is about the same as when the cutter was new, or the Exhibit Busell Cutter (Orcutt patent of '81) referred to.

Cross-int. 41. Is there any difference between the Exhibit Old Busell Cutter and the Orcutt cutter in the facility for sharpening by grinding on the flat front face?

Ans. There is no difference except the comparative duration or wearing qualities of the cutters when sharpened upon the flat front face.

Cross-int. 42. Is there any difference between the duration or wearing qualities of the Orcutt cutter and the Brown patent gear-cutter in the same respect?

Ans. None that I am aware of.

(Adjourned.)

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Cross-int. 43. Please examine both Complainants' Exhibit Corthell Patent Cutter and Defendants' Exhibit Cutter, Corthell patent No. 207,395, Aug. 27, 1878 (the latter cutter is now put in evidence), and state whether or not you think the top face of the teeth therein acts as a guard when they are operating on a sole edge?

Ans. I don't think they do in the sense in which the top face of the tooth of the Orcutt cutter does.

Cross-int. 44. Please examine the cutters marked Defendants' Exhibit Worn Cutters and state whether in your opinion they were

gradually worn away by trimming and grinding to their present condition.

Ans. I think one of the three was; I refer to the one which has the thickest blade. My reason for thinking the other two have not been used since they were last ground is from the fact that I find nearly every blade has had the temper drawn by overheating during the operation of sharpening, and it appears to me extremely doubtful that these cutters last referred to have been used since that time, for, in my judgment, if such had been the case the points so softened by grinding would have been bent back in any ordinary attempt to use them.

Cross-int. 45. Do you or not think the worn cutter having the thickest blades, referred to in your last answer, was an operative cutter capable of doing good work up to the time that it was laid aside?

Ans. I have no doubt that it was capable of doing work which some might consider good work, but it certainly is not, in my judgment, capable of doing as good work as a new cutter of that kind.

Cross-int. 46. What is the difficulty with its doing good work?

Ans. The space between the teeth being enlarged by grinding is the only reason I see for its not being capable of doing as good work as a new cutter.

Cross-int. 47. Why does the increase of space between the teeth incapacitate it from doing good work? Is the distance from one cutting edge to the other increased by grinding?

Ans. For the reason that as the space between the teeth is enlarged that part of the tooth which acts as a guard for the rankness of the cut is decreased, and consequently, although the cutter
133 may be capable of doing work, yet the quality of the work done will be inferior to that done with a new cutter of the same make. The distance between the cutting edges of the teeth between an old and new cutter is the same if all blades are ground alike.

Cross-int. 48. Then you think the guard afforded by the outer face of the teeth is a changeable guard, decreasing with every grinding of the cutter. Is this so?

Ans. That portion of the cutter which acts as a guard is necessarily decreased by grinding and I believe that as the space between the teeth is increased by grinding and consequently the surface, which acting as a guide decreased, the cutter is incapable of doing as good work as it is when it is new.

Cross-int. 49. Then you believe that the amount of guard upon the outer face of Orcutt's cutter and its efficiency is changed at every grinding and becomes less and less at each grinding. Is this so?

Ans. I think that is the fact.

Cross-int. 50. Take Complainants' Exhibit Busell Cutter (Orcutt patent of '81), and suppose it to be gradually worn away by use and sharpening to the condition of the thinnest toothed of either of Exhibit Worn Cutters, and state at what stage of its use, in your opin-

ion, would it perform the best work and render the most efficient service?

Ans. At the time it is new.

Cross-int. 51. Do you think the outer face of its teeth would continue to act as a guard as long as the tooth remained serviceable?

Ans. It will continue to act as a guard for the cutting edge of that particular blade, but will not be as efficient as a guard for the tooth which follows it, for the reason that in the operation of grinding the space between the cutting edge and the heel of the tooth in advance of it is widened.

Cross-int. 52. Then if a cutter is sharpened upon its outer face instead of its front face, as you say the Exhibit Old Busell Cutter is sharpened, the amount of guard will not be diminished, but will be increased because the spaces between the teeth will be lessened as the cutting edges are brought nearer the center by grinding. Is this so? If not, please state why it is not.

Ans. In the Busell cutter referred to in your question, if
134 the top faces of the teeth were ground in such a manner as to act as a guard or gauge to the rankness of cut, and in the operation of sharpening particular care was taken to so grind it not only as relates to the angle of the top face of the tooth, but also to keep the edge of each tooth the same distance from the center or axis upon which it moves, then the conditions stated in your question would be true to the extent of a limited amount of surface which acts as a guide, and would be of no practical value as a guide for the tooth following.

Cross-int. 53. Do you think that cutters like Exhibit Old Busell Cutter have more or less rake of teeth than the Orcutt cutter, and do they have more or less space between the cutting edges of the teeth, and what is the relative number of teeth in the two cutters?

Ans. The old Busell cutter referred to has more rake than has the Orcutt cutter; the distance between the cutting edges is less, the Busell cutter having twenty-two blades and the Orcutt sixteen.

Cross-int. 54. What proportion of the thickness of teeth in the Exhibit Busell Cutter (Orcutt patent of '81) would have to be ground away before the guard which you say the outer face of the tooth affords would be reduced to an equality with that furnished by the outer face of the teeth of Exhibit Old Busell Cutter, taking into consideration the relative distance between the teeth when they are new, the fact that the distance between the teeth in the Orcutt cutter increases at every grinding, while in the old Busell cutter it decreases at every grinding, and the further fact that the thickness of the outer face of old Busell cutter remains constant at every grinding while it decreases in the Orcutt cutter.

Ans. The teeth of the Orcutt cutter would have to be ground away about as much as that shown in the thickest blades of the Exhibit Worn Cutters.

Cross-int. 55. Do you think there is sufficient guard on the Exhibit Old Busell Cutter to enable the workman to do good work rapidly and without difficulty?

Ans. I don't think there is.

Cross-int. 56. If you were told, as has already been suggested in a former question, that the complainant company had always, up to the present time, illustrated and advertised the old Busell cutter in their catalogues, and that manufacturers had purchased
135 the same and their workmen trimming by the piece had used these cutters right alongside the Orcutt cutter up to the present time, would it change your opinion with regard to the efficiency or value of the old Busell cutter?

Ans. It would not.

Cross-int. 57. Do you think, in view of the almost total destruction of the amount of guard on the thinnest teeth of Exhibit Worn Cutters, that good work could be done by cutters as worn as those most worn in those exhibits, taking into consideration your former statement that the best work can be done when the cutters are new, because then there is the most guard, and that the guard decreases at every grinding?

Ans. I do not think that good work could be done by the cutters referred to in your question, for the reason that they are worn out, and, like all other tools which are worn out, they are incapable of doing good work.

Cross-int. 58. Do you think the Orcutt cutter would perform good work if the flat front face were upon an exact radial line?

Ans. I do not.

Cross-int. 59. What are your reasons for that opinion?

Ans. My reasons for this opinion are the same as they would be in relation to any other tool constructed for a special purpose—that, were the front face of the tooth on a radial line, it would be an improper form to give it, and would not be best adapted to the purpose, for which it was intended. The tendency would be, in such a case to scrape the material operated upon instead of slicing it.

Cross-int. 60. If it be necessary, as you state, to give the front of the tooth an overhang or hook shape, as you term it, what amount of overhang do you think is necessary? Do you think there is any limit or any rule, and can you state approximately what you think to be the proper overhang?

Ans. I think that would depend greatly upon the material to be operated upon—whether it be soft or hard—and I have no doubt that the operators change this angle by grinding when operating upon different kinds of stock, which it is a very common thing to do in other classes of rotary cutters when adapted for different kinds of metals. I presume, however, that the angle of the front
136 face of the tooth of the Orcutt cutter when made new is best adapted, which has been ascertained by experiment, for the general run of work, keeping in view, of course, the other proportioning and forming of the tooth.

Cross-int. 61. Do you mean to be understood, in the last answer, that it is the common practice among workmen to vary the rake of the front face of the teeth according to the work they are using rotary cutters upon?

Ans. If a rotary cutter is made to be used exclusively upon one kind of metal, the rake of the tooth should be different than if it was

made to be used upon a different kind of metal; and, in case it is convenient to change the angle by grinding, it is good practice to do so where speed and excellence of workmanship is required.

(The entire answer is objected to as evasive and not responsive.)

Cross-int. 62. The former question is repeated, and the magistrate is requested to call the attention of the witness to the terms of the question. (Int. 61 repeated.)

Ans. It is the practice where such a cutter is capable of being ground or changed in that particular, yet it may not be said to be a common practice, but is a common desire on the part of a workman skilled in such an art.

Cross-int. 63. When do you think the greatest overhang is required in Orcutt's cutter—when the cutter is first used or in the last stages of service?

Ans. I think that depends entirely upon the nature of the material to be operated upon.

Cross-int. 64. Please answer the preceding question with the understanding, which would seem to be a natural inference, that the stock or leather was the same in both its later and earlier use.

Ans. I think there is no difference required, when considered as you suggest in your last question.

Cross-int. 65. Do you think the overhang in Orcutt's cutter operates in any different manner, performs any different office, or produces any different result than does the overhang in the old Busell cutter? If you think it does, please give your reasons therefor.

Ans. So far as that angle is concerned of itself, separate from any other parts of the tooth, there is no difference in that particular in the two cutters named in your question.

137 Cross-int. 66. You have spoken of the velocity at which Orcutt's cutter is revolved when in use. Do you understand that Orcutt effected any change or improvement in the matter of the peripheral speed of rotary cutters?

Ans. I do not so understand it.

Cross-int. 67. If, as you have stated that you believe, any of these cutters will cut directly into the sole to any depth if the sole be passed toward them, is it not plain to your own mind that the depth or rankness of cut depends upon the pressure or force with which the sole edge is held against the cutter and not upon the shape of the outer face of the tooth? Please consider this matter and give your best judgment thereon.

Ans. With my experience in the art of making and using tools of different kinds and for different purposes, it is perfectly clear to my mind that the gauge for rankness of cut in the Orcutt cutter *which* is that part of the tooth extending back from the edge, in the same sense as the body of a carpenter's plane is a guide for its cutter; yet it is clearly understood that by repeated movements of the carpenter's plane in the directions in which it is designed to move, although it will only remove a thin shaving at each stroke, yet you may plane a board from an inch thick to half that thickness or less; and

for the foregoing reasons I do not believe that the rankness of the cut of the Orcutt cutter is due to the pressure of the shoe against it any more than it is, in the case of the carpenter's plane, due to the pressure exerted by the workman upon the plane and against the stock to be operated upon.

(Noon recess.)

Cross-int. 68. Do you think the comparison of the Orcutt cutter with a plane is correct in view of the fact that you can only plane a board away by reducing its surface the entire length and cannot materially lower the surface of the board in a space not longer than the plane?

Ans. I consider the comparison correct, so far as the guide or gauge for the rankness of the cut is concerned, and I will state also that there are carpenter's planes the body of which is formed to adapt them to work on a curve, in which case a curved surface might be made in a flat board which would correspond with
138 the outline or curved bottom of the plane and yet not reduce the board in its entire length. This, I think, will add the clearness to my previous answer.

Cross-int. 69. Did you intend to confine your previous answer to curved planes or to straight ones or to both? How do you wish to be understood in that respect?

Ans. I consider the comparison of either sufficient for the purpose of describing my meaning as to the guide for the rankness of cut, yet the curved-bottom plane will, perhaps, more clearly illustrate my meaning in this connection than would the straight-bottom plane.

Cross-int. 70. When the iron is set in the plane it is impossible to vary the thickness of shaving cut thereby unless the iron be reset to project a different distance through the stock. Is this so?

Ans. That is correct, as a rule; but there are exceptions that might be cited in this matter.

Cross-int. 71. Name them.

Ans. One of these exceptions will be clearly understood by imagining the mouth or that part of the body of the plane directly in front of the cutting edge removed farther from the edge and thus giving what is termed an open mouth to the plane. Another exception would be the kind of material or stock operated upon, whether it be straight-grained or otherwise or spongy. The variation of the depth of the cut or thickness of the shaving will be slightly decreased or increased by either of the foregoing conditions.

Cross-int. 72. Do the same reasons apply, and in about the same degree, to the Orcutt cutter or not?

Ans. I think the same reasons would apply under the following conditions: The open mouth of the carpenter's plane would be seen in a degree proportional to the distance between the cutting edge of the Orcutt cutter and the heel of the blade directly in front of it. That will be clearly understood in Defendants' Exhibit Worn Cutters. That condition coupled with a spongy stock would, no doubt,

produce a ranker cut than would be the case with a new cutter of the Orcutt make.

Cross-int. 73. Having given your views in regard to the guard-like capacity of the Orcutt teeth, please examine Complainants' Exhibit Busell Cutter (Orcutt patent of '81) and state what is your opinion of the depth of the cut therein when acting upon
139 the sole edge, and in considering this question please observe all the rules and reasons you have given in your foregoing answers, and make your answer as correct as you possibly can.

Ans. The depth of the cut of each blade of the Orcutt cutter would be proportional to what each blade would project beyond that point upon its flat face which the heel of the other cutter would touch, provided its curved top face was extended to that point, and would, in my opinion, be about one thirty-second of an inch, more or less.

Cross-int. 74. You entirely misapprehend the previous question. You are not asked what is the depth of cut of each tooth, but the depth of cut carried by the cutter. Will you give that—that is, what would be the practical depth of cut that would be carried along the shoe sole with that cutter in trimming it?

Ans. About one thirty-second of an inch, more or less.

Cross-int. 75. Is one thirty-second of an inch your best judgment?

Ans. It is.

Cross-int. 76. What depth of cut do you think could be practically carried along a sole edge in trimming it with cutters in the condition of Exhibit Worn Cutters? Would it be greater or less than with Exhibit Busell Cutter (Orcutt patent of '81)? And, if either, state the difference as near as you can.

Ans. I think the depth of cut that you would get by the worn cutter would be greater than in the new cutter, for the reason that the distance from the edge of one blade to the heel of the blade preceding it and which acts as a guide for it is greater in the worn cutter than in the new one. The exact proportion or amount of extra depth of cut would be hard to determine, and would vary somewhat upon different conditions of the stock to be cut.

Cross-int. 77. Take average stock. What depth of cut do you think you could carry with these Exhibit Worn Cutters?

Ans. Perhaps three sixty-fourths of an inch.

Cross-int. 78. Please make the same answer with respect to Exhibits Corthell Cutters, bearing in mind that you have expressed the opinion that the top of the tooth does not act as a guard in these cutters.

140 Ans. In the Corthell cutters I think the depth of the cut will depend somewhat upon the pressure exerted by the operator against the cutter, and could be made somewhat deeper than is the case in Orcutt cutter.

Cross-int. 79. How deep a cut do you think could be carried was what was called for by the previous question.

Ans. That, I think, would depend upon the resistance offered by the operator to the tendency of the Corthell cutter to take the shoe

in the direction in which it is revolving, and if the operator were strong enough he might get a cut an eighth of an inch or more in depth.

Cross-int. 80. How shallow a cut do you think can be carried along a sole edge with these Exhibits Corthell Cutters?

Ans. That would depend upon the same circumstances of the pressure against the cutter, and, if the pressure is light, I have no doubt a cut might be made not more than a hundredth of an inch in thickness and perhaps less, but would be constantly varying in thickness as the pressure against it varied.

Cross-int. 81. Do you mean by the last part of your answer that it would not be practical to carry a light cut along the sole edge with a Corthell cutter?

Ans. That is what I mean.

Cross-int. 82. What depth of cut do you think could be carried with the Exhibit Old Busell Cutter?

Ans. I think the same conditions would apply with the Exhibit Old Busell Cutter as regards the pressure against it, and the strength of the operator and the variation of the thickness of the cut, as have been explained by me in relation to the Corthell cutter.

Cross-int. 83. Have you ever trimmed shoe soles with rotary cutters?

Ans. Not to any extent.

Cross-int. 84. When and where?

Ans. In Syracuse, N. Y., and in Rochester, N. Y.; but my experience was simply for my own enlightenment in the matter of rotary cutters for that purpose.

Cross-int. 85. What kind of cutters did you use or see used?

Ans. The old Busell cutter in Syracuse, and in Rochester I don't know what the cutter was, whether it was a Busell or not.

141 Cross-int. 86. Please examine the Exhibit Snell & Atherton Hand Tools in connection with Orcutt's cutter, and state whether you find anything in Orcutt's cutter different from what you find in these hand tools except the fact that Orcutt's teeth are carried around an entire circle, while in the hand tools they — arranged in the arc of a circle, and that Orcutt provides a hole for the arbor?

Ans. I do find other differences than those named in the question.

Cross-int. 87. Please specify them.

Ans. In the Orcutt cutter the top face of the blades *which* is the arc of a circle, the center of which circle is not the center of the cutter; neither will the center of that arc apply to any other but its own blade. Therefore if it was necessary to find the center of the arc of the circle of the top of a tooth there would be a different center for each tooth and as many centers as there are teeth, while in the Snell & Atherton cutter the top face of the tooth is an arc of a circle and a circle described from one center will coincide with the top surface of all these teeth.

Another difference is there is a fixed guard or guide for the depth of cut in front of the front blade which is not a cutter.

Cross-int. 88. In what you have said in the previous answer in relation to there being a different center to each tooth in the Orcutt cutter, do you mean anything more than that the teeth were bent back in order to give them a clearance or freeing by rendering the top face of the tooth eccentric to a circle which should touch their front edge? If you mean anything different from that please state it.

Ans. That is in substance what I meant in reference to the Orcutt cutter.

Cross-int. 89. Please examine the Exhibit Snell & Atherton Cutters, especially upon the front and back faces of the teeth, and observe that they are curved, and state whether or not you think they were bent back since they were milled.

Ans. I have examined the cutters referred to in the question, but the indication that they were bent back since they were milled is so slight, even on the teeth which show it most, and none at all on others, that there remains a doubt in my mind whether they were bent back or not.

142 Cross-int. 90. What is your best judgment that the outer face of the teeth in the Exhibit Snell & Atherton Cutters is in a true circle or eccentric to a circle which would coincide with their cutting edges?

Ans. In my judgment they are on a true circle; but if they are not the fact is not clear to my mind from observation.

Cross-int. 91. Do you wish to be understood by your previous answers that you cannot determine by examining these Snell & Atherton Cutters whether or not they have clearance or freeing by reason of the top face of the teeth being eccentric to a true circle?

Ans. I find it extremely difficult to detect it by observation, and I have no other means at hand to determine; and if they were set back it appears to me that it would be necessary that they should be set back sufficiently to be easily seen, and I confess that I cannot detect it by observation.

Cross-int. 92. You spoke in a previous answer of a piece in the Snell & Atherton cutter in front of the front blade which is a fixed guard or guide for the depth of cut. Do you think that is a guard, or only a piece resulting from the formation of the cutter; and if you think it is a guard, do you think it acts as a guard for all the teeth or for only one tooth?

Ans. I think the piece referred to was intended for a guard for the front tooth.

Cross-int. 93. Do or not the teeth in the hand tool Snell & Atherton cutters possess a guard on the outer face in the same sense that the teeth do in the Orcutt cutter?

Ans. I think the teeth in the Snell & Atherton hand cutter act as a guard for each other so far as they can be arranged so in this make of cutter, but it is evident that the guard for the front blade is not a cutter.

Cross-int. 94. Please state, as the preceding question asks, whether the outer face of the teeth in the Snell & Atherton hand tools serves as a guard in the same sense as in the Orcutt cutter.

Ans. I do not think that the outer face of the tooth of the Snell & Atherton cutter acts as a guard in the same sense that it does in the Orcutt cutter.

Cross-int. 95. What are your reasons for this opinion?

Ans. My reasons for this opinion are that in the Orcutt
143 cutter the tooth is bent back or otherwise formed to an angle with the flat front face and serves as a guard, not only for the rankness of its own cut, but also as a guard for the tooth which follows it, while in the Snell & Atherton cutter, the tops of the teeth being all on the same arc, they serve as a guide only for its own cutting edge.

Cross-int. 96. Do you or not think that the product of the Orcutt cutter and the Snell & Atherton cutters would be the same—that is, would the shoe sole trimmed by each be the same, provided they had the same peripheral configuration?

Ans. I think they would be the same.

Cross-int. 97. Assuming the Snell & Atherton cutters to be old and well known at the date of Orcutt's invention; that it was then old and common to trim shoe soles with rotary cutters; that cutters made like Brown's patent of 1864—that is, like the Exhibit Brown Patent Gear Cutter, which had a molded top face and a flat front face which could be ground without changing the configuration of the top; that a rake in the teeth was common, as shown in the Snell & Atherton cutter, and that cutters having a molded top surface adapted to trim the rand and bed and guard of the sole were shown in the Snell & Atherton cutters, did Orcutt, in your opinion, do anything except to change the form of the cross-section of the periphery of a cutter having the features of the Brown patent and cutter and adapted to trim shoe soles? If you think he produced anything else, please define what it was.

Ans. I think Orcutt did in his invention produce something new in the way of rotary cutters, which made it possible to have a guide for the rankness of the cut, which guide is a part of the tooth of the cutter. Another point which I consider to be new with Orcutt is the arrangement of the front face of the tooth at such an angle to a radial line from its edge as to tend to draw the material towards the cutter, and also the arrangement of the angle of the top face with the front face to tend to keep the shoe from being drawn nearer to it than the depth of the cut required. This also required that the distance between the cutting edges should be proportionate to the angle of the front face and the top of the tooth.

(Adjourned.)

144 BOSTON, *Feb.* 6, 1885.

(Counsel present as before.)

That I may be more clearly understood in my answer as to whether Orcutt, in the construction of his cutter, discovered anything new, I will explain that one of the novel elements in the Orcutt cutter is a guard or guide to regulate the rankness of the cut, which guard or guide is a part of the blade of the cutter, having the

same form as the cutter, consisting of a rand lip, bead, bed, and guard and channel guard.

Another novel feature in this cutter is the angle formed by the flat front face and top molded face of the tooth; also the rand lip, being a part of the tooth and capable of being sharpened on the flat front face. Therefore I consider the Orcutt cutter an invention of novelty and value.

Cross-int. 98. Since the adjournment, have you conversed with Mr. Maynadier, counsel for complainants, in relation to your testimony in this suit?

Ans. I have conversed with Mr. Maynadier in relation to the novelties of the Orcutt cutter, if that may be considered in relation to my testimony.

Cross-int. 99. Have you seen the Orcutt cutter in operation in trimming shoe soles; if so, when and where, and who were present?

Ans. I never saw the Orcutt cutter in operation in trimming shoe soles.

Cross-int. 100. Have you had its operations described to you; if so, when and by whom first?

Ans. I don't think I ever had its operation described to me in full at any time or by any person, but I have entered into conversation with different persons in relation to the novelties of different kinds of cutters.

Cross-int. 101. With whom have you, before commencing to give testimony in this suit, conversed with relation to the operation of the Orcutt cutter?

Ans. I have conversed with a great many persons—Mr. Kirby, who was at one time my tool-maker; Mr. Seelye, superintendent of the Hawkins Machine Co.; Mr. Fifield, Mr. Maynadier, Mr. Noble, and others.

Cross-int. 102. Then you know nothing of its practical
145 operation except what you have been told by others and your own theories concerning it; is this so?

Ans. That is not so.

Cross-int. 103. If you have not seen it operate what are your other sources of knowledge regarding the practical operation of the Orcutt cutter?

Ans. I have no recollection of stating that I have not seen the Orcutt cutter in operation except upon shoe soles.

Cross-int. 104. In what other manner have you seen it in operation?

Ans. On pieces of wood and leather for my own instruction and not in the presence of any one, so far as their knowledge of what I was doing was concerned.

Cross-int. 105. How did it operate on wood—successfully or not?

Ans. I found the best success, so far as holding the wood was concerned, when working upon the end grain of the wood, but my experience was not very extended in that direction.

Cross-int. 106. What is your opinion? Would it be practical to mill metal with Compl'nts' Exhibit Busell Cutter (Orcutt patent of '81) or not?

Ans. I do not consider it a practical cutter for the purpose specified in your question.

Cross-int. 107. Do you think it could be done—that is, would it mill cast iron, wrought iron, or the harder kind of brass known as composition?

Ans. I do not.

Cross-int. 108. You have spoken in your answer to cross-int. 97 of "the angle formed by the flat front face and top molded face of the tooth" in Orcutt's cutter. Do you think that original with Orcutt in leather-trimming tools?

Ans. I think it is original with Orcutt when the top molded face consists of the rand lip, bead, bed, guard, and channel guard.

Cross-int. 109. Then you do not find the features referred to in your last answer in any of the exhibits other than Orcutt cutters shown you during this examination; is this so?

Ans. I do not.

Cross-int. 110. Please examine Defendants' Exhibits Dunham Edge Cutter, Hazard's Improved Dunham Edge Cutter, and
146 the Exhibit Snell & Atherton Cutters, and Complainants' Exhibit Hand Plane, and state wherein the angle produced by the top molded face and front face of the teeth differs from that shown in Orcutt's.

Ans. It differs in extent or degree, which is necessary, the tools referred to being hard tools and having the gauge for rankness of cut other than that within the blade.

Cross-int. 111. Do you mean by the last answer that you do or do not find a practical difference between the teeth in the Exhibit Hand Tools specified in the previous question and the Orcutt cutter, in the matter therein specified, to wit, the angle produced by the relation of the flat front face and top molded face of the teeth? Will you answer this explicitly one way or the other?

Ans. There is a difference in the degree of the angle, which would be a practical difference were the angles employed in the hand cutters used in the rotary cutter — much as Orcutt's.

Cross-int. 112. In which is the angle most acute, the Orcutt cutter or the hand tools?

Ans. In the hand tools.

Cross-int. 113. Do you mean all the hand tools? If not, specify which.

Ans. I mean all the hand tools referred to in the question.

Cross-int. 114. In which is this acuteness greatest, the Exhibit Busell Cutter (Orcutt patent of '81) or Exhibit Old Busell Cutter?

Ans. In the Complainants' Exhibit Busell Cutter (Orcutt patent of '81), but the difference is not very marked.

Cross-int. 115. Then it seems from your preceding answers that Orcutt's cutter differs from the other exhibits in the matter of the acuteness of the angle between the top and front faces of the teeth in being less acute than the teeth in the hand tools and slightly more acute than in the old Busell cutter; is this so?

Ans. They do differ in that particular.

Cross-int. 116. You spoke in answer to cross-int. 97 that the rand

lip in Orcutt's cutter is a part of the tooth. Do you think it is any part of his invention to constitute the rand lip a part of the tooth itself, or would it be the same if he made the rand-cutting portion of the cutter separate from the bed and guard?

Ans. I think the rand lip in the Orcutt cutter, being made
147 a part of the tooth which has a molded top and capable of being ground on the flat front face, constitutes a part of Orcutt's invention.

(The answer objected to as evasive and not responsive, and the question is repeated until it is answered.)

Cross-int. 117. (Cross-int. 116 re-read.)

Ans. I do think the rand lip in the Orcutt cutter, being a part of the tooth, constitutes a portion of his invention, and would not if made separately.

Cross-int. 118. Suppose a cutter to be made in three parts, which, when brought together, would cut a path like Exhibit Busell Cutter (Orcutt patent of '81), one part being the rand lip, another the bed, and another the guard, each being molded on the top and having a flat front face, as in Exhibit Busell Cutter (Orcutt patent of '81), do you think such a cutter would be like or substantially unlike the cutter described in Orcutt's patent of '81 and the Exhibit Orcutt Cutter referred to in this question?

Ans. I think a cutter made as described and capable of performing the functions described in the question would be substantially the same as the Orcutt cutter.

Cross-int. 119. Then if a cutter made in three pieces would be substantially the same as the Orcutt cutter, why would it be new to make a rand lip like that in the Exhibit Hand Tools as a part of the tooth itself, when a rotary rand-cutter in connection with a trimming tool was old in the Tayman patent?

Ans. For the reason that the rand lip in the Orcutt cutter, which is a rotary cutter and not a hand plane and in which it is sharpened by grinding upon the flat front face, *and* has a shield or disk to prevent the cutter from marring the upper of the shoe, which is not a part of the cutter, as is the case in the hand planes.

Cross-int. 120. Do you think the shield or rotary disk was new or original with Orcutt in rotary cutters?

Ans. I think the shield or disk when combined with a cutter, each blade of which is formed on the top face with the rand lip, bead, bed, and guard and capable of being sharpened by grinding the flat front face, was original with Orcutt.

Cross-int. 121. The previous question asked whether you thought a rotary guard disk with a rotary cutter was new with Orcutt or not.

148 Ans. I do not think the rotary guard or disk was new with Orcutt separate from any other element.

Cross-int. 122. Do you think it performs any other office or result when used with his cutter than with any other?

Ans. I think it does, for the reason that in some rotary cutters it acts not only as a protection for the upper, but at the same time

clamps or holds in place the rand-cutter, which is not a part of the other teeth of the cutter. This is not necessary in the Orcutt cutter.

Cross-int. 123. Does it hold the parts of the cutter together or does it only receive and transmit the strain of the screw which holds them together?

Ans. The disk is held by the screw and comes in contact with the rand-cutter, which the screw probably does not; therefore in one sense it holds the rand-cutter in place.

(Noon recess.)

Cross-int. 124. What is the object of a rand disk in connection with a rotary cutter?

Ans. To protect the upper from the corner of the rand lip.

Cross-int. 125. Suppose the rand guard was dispensed with, would not the screw that holds the cutter in place also hold the rand lip or cutter if it was made separate from the main body?

Ans. I don't understand the meaning of the question sufficiently to give an intelligent answer.

Cross-int. 126. In answer to cross-int. 122 you stated that you thought the rand performed another office or result in connection with the Orcutt cutter from what it with other cutters, because, as you there stated, in some other cutters it clamps or holds in place the rand-cutter when it is not a part of the teeth of the cutter. Please refer to that answer and state whether you have the same opinion still.

Ans. I have the same opinion, for the reason that in some other cutters than the Orcutt it performs the additional function of serving to hold the rand-cutter in place; yet, as you refer to a case in which the rand guard is removed, I have no doubt that the rand-cutter could be held in place by a screw.

Cross-int. 127. You have spoken in the early part of your
149 testimony of the difference in the manner of holding articles of metal to be milled from that of holding shoes to be trimmed. Do you understand that either of those methods has any relation to Orcutt's invention?

Ans. There are certain novelties in the Orcutt cutter which have reference to a means employed in presenting the work or shoe to the cutter by hand, and these novelties render the Orcutt cutter unfit for practical milling-cutters to be used on metals.

(Answer objected to as not being responsive, but an argument for complainants which this witness has repeatedly delivered during this examination.)

Cross-int. 128. The question is repeated, with a suggestion that the witness confine himself, as the question asks, as to whether he does or does not think the manner of holding articles of metal to be milled or shoes to be trimmed has anything to do with Orcutt's invention.

(Cross-int. 127 re-read.)

Ans. I do understand it so.

Cross-int. 129. Do you understand that Orcutt's invention produced or led to any new method of holding the shoe from what was known and practiced before?

Ans. I do.

Cross-int. 130. How was the shoe held while being trimmed by rotary cutters before Orcutt's invention?

Ans. It was held against the cutter by the hands of the operator, and the thickness of the chip was regulated by the amount of pressure with which the sole edge was brought in contact with the cutter.

Cross-int. 131. How different when trimming with Orcutt's cutter?

Ans. In the case of Orcutt's cutter the thickness of the chip is determined by the angle formed by the top and the flat front faces of the tooth and the distance between the cutting edges.

Cross-int. 132. Please explain what relation or connection there is between holding metal to be milled and holding shoes to be trimmed in either or both the cases just described.

Ans. In the case of milling metal the material is clamped
150 to a table which is capable of being moved upon fixed ways instead of presenting it by hand, as in the case of trimming shoes, and the thickness of the chip in milling metals is determined by the speed and adjustment of the table.

(Answer objected to as a most palpable evasion of the question, and the witness is asked to consider that the question does not inquire as to the method of milling metals, about which every man of ordinary experience is supposed to be acquainted, and the witness is further reminded that the question asks what relation the holding of articles of metal to be milled has to the holding of shoes to be trimmed in the cases referred to — the previous question.) With these suggestions the question is repeated.

Cross-int. 133. (Cross-int. 132 re-read.)

Ans. I have explained the methods of holding shoes to be trimmed and metals to be milled, and I see no relation that one has to the other, except that in both cases the material to be milled or the shoe to be trimmed must be moved in relation to the axis of the cutter. By this I mean that there must be what is called a feeding movement either of the material in relation to the cutter or of the cutter in relation to the material.

Cross-int. 134. In answer to cross-int. 131 you state (as in repeated other instances you have stated in effect) that "in the case of Orcutt's cutter the thickness of the chip is determined by the angle of the top and the flat front faces of the tooth and the distance between the cutting edges." Please state how you know this fact if you have never used them in trimming shoe soles.

Ans. I derive my knowledge from the experience I have had with tools of different kinds, and also what little experience I have had in the rotary cutter upon leather and wood to satisfy myself of the comparative merits of rotary cutters for trimming shoe soles.

Cross-int. 135. Do you think Compl'nts' Exhibit Busell Cutter

(Orcutt pat. of '81) possesses the proper proportions between the top and front flat faces of the teeth and space between the cutting edges of the teeth referred to in answer to cross-int. 131 to carry Orcutt's invention into effect in a successful manner?

Ans. From the general knowledge I have with cutting tools and the experience I have had with the Orcutt cutter I have no
151 doubt the cutter referred to is capable of doing good work. The excellence of the work is due to the proportions referred to in this question.

(The answer is objected to as evasive and not responsive.)

Cross-int. 136. The question is repeated, with the suggestion that it enquires whether the Exhibit Cutter named possesses the proper proportions between the top and front flat faces of the teeth and space between the cutting edges of the teeth to carry Orcutt's invention into effect in a successful manner—that is, not whether it will do good work or bad work, but as successful as Orcutt's invention was capable of being carried into effect.

(Cross-int. 135 re-read.)

Ans. I do think so.

Cross-int. 137. Do you think this cutter varies in any material respect from that shown and claimed in Orcutt's patent of '81?

Ans. I don't think it does.

Cross-int. 138. Do you think the relation between the top and front faces of the teeth as shown in Compl'nts' Exhibit Busell Cutter (Orcutt pat. of '81) could be changed to any extent without affecting the efficiency of its operation?

Ans. I think it might be changed to a slight extent and would increase its efficiency for the particular material then operated upon, and it might be changed in another respect and decreased in its efficiency.

Cross-int. 139. How much less acute do you think the angle of the teeth could be made and cut firm leather with good effect?

Ans. I think that in proportion as the acuteness of the angle is decreased you also decrease its capacity for doing good work. No doubt the angle might be reduced a little without any noticeable effect upon such stock as you refer to in your question.

Cross-int. 140. Suppose the front edge of this cutter was brought to a true radial line, leaving the top face as it is, do you think it would then do good work on any quality of leather?

Ans. I do not.

Cross-int. 141. Could the acuteness of angle of the top and front faces of these teeth be increased without, in your opinion, impairing their efficiency?

Ans. They could slightly.

Cross-int. 142. To what extent, in your opinion?

Ans. That is a matter which can only be demonstrated with
152 any accuracy by experiment, but I should think that if the rake of the flat front face were one-half more than it is now it would be all could be allowed, particularly when trimming thick

stock, as that would increase the rankness of the cut, and if it was in use upon thick stock would have a tendency to pull pretty hard upon the operator's hands.

Cross-int. 143. If the acuteness is increased would not the teeth pass through the leather easier than if not increased?

Ans. I think not in this instance, for the reason that the rankness is increased at the same time.

Cross-int. 144. Please state what you mean by rankness.

Ans. I mean the thickness of the shaving removed by each tooth.

Cross-int. 145. Do you think the thickness of the shaving removed by each tooth would be increased by increasing the acuteness of the angle at the edge of the teeth?

Ans. It would slightly.

Cross-int. 146. How can that be if the top of the tooth acts as a guard to govern the depth of the cut, as you have all along insisted?

Ans. I have never insisted that the entire surface of the top of the tooth acts as a guard at the same time.

Cross-int. 147. Have you not stated repeatedly that the depth of the cut of the Orcutt cutter is determined by the top of the tooth, which acts as a guard, and do you now wish to be understood as so stating or so denying?

Ans. I have so stated, but, as I said in my last answer, I never have stated that the entire surface of the top of the tooth acts as a guard at the same time. The extent used for such guard would depend somewhat upon the rake of the front tooth and the angle of the top face and the condition of the stock operated upon.

Cross-int. 148. Why do you in the last two answers introduce the question of whether the entire surface of the top of the tooth acts as a guard or not? Have you made any such qualification before in your numerous answers, and is there anything in the preceding questions calling out or justifying such qualifications? If so, please point it out.

Ans. My reason for introducing the question referred to was to answer your question as to what the effect would be in case the rake of the front face of the tooth was increased.

153 I don't think I have made any such qualifications in my former answers, for the reason that I did not think it was necessary in answering the questions put to me.

I would point out the question relating to the effect of an increased rake upon the front face of the tooth as justifying me in the statement referred to.

Cross-int. 149. Have you not heretofore stated in substance that the more top surface there was to the tooth the better it would operate, because there was more guard?

Ans. My statement to which you refer was in relation to the worn cutters and the consequent distance between the heel of one tooth and the cutting edge of the one following it, and had no reference in the sense referred to in your question.

Cross-int. 150. What effect in the Orcutt cutter does the increase of the distance between the back of one tooth and the front of the

next have except to decrease the top face, which you say is the guard?

Ans. It has the effect, as I have stated in a previous answer in reference to the worn cutters, of making what would be called in carpenters' planes an open mouth by removing the cutting edge farther from the heel of the tooth which preceded it.

Cross-int 151. Can you enlarge the mouth, as you call it, or the space between the teeth in any degree without diminishing in the same degree the outer face of the tooth, which you call the guard?

Ans. No; you cannot.

Cross-int. 152. Then when you speak of the distance between the teeth as in any case being increased it means, in fact, a decrease of the top surface or guard to that extent, does it not? Or, in other words, is there in Orcutt's cutter any change in the distance between the teeth without a change to the same extent in their top face?

Ans. (To the first part:) It does. In answer to the last part of this question I will say that as the space between the teeth is increased so the top face of the tooth is decreased to the same extent.

(Adjourned.)

BOSTON, *Feb.* 7, 1885.

(Counsel present as before.)

Cross-int. 153. Do you now think that the top face of the teeth in Orcutt's cutter could be materially decreased without impairing its efficiency?

154 Ans. If the question relates to the decreasing of the teeth in Orcutt's cutter by the process of sharpening it does impair their efficiency to the extent to which they are ground—yet, perhaps, in a slight degree—at the first sharpening.

Cross-int. 154. Suppose the cutter was made with the same distance between the cutting edges of the teeth shown in Exhibit Busell Cutters (Orcutt patent of '81), but with double the space between the teeth, as there shown, do you think it would work as well as Exhibit Cutter?

Ans. I think there would be no practical difference in the working of the cutter, unless it might be upon very spongy or soft stock. I think in that case, unless the cutting edge was very keen, it would not work quite so smoothly. Upon firm stock there would be no particular difference in the efficiency of the tooth.

Cross-int. 155. Do you think it makes a difference whether the cutter is made with teeth having greater space between them than is shown in Busell cutter (Orcutt patent of '81), or whether the space there shown should be increased by grinding as the cutter required sharpening?

Ans. If the distance between the cutting edges are the same I can see no difference in the two cases cited in the question—that is, whether the teeth are milled away in the process of making the cutter or ground away in the process of sharpening.

Cross-int. 156. Suppose the Exhibit Busell Cutter (Orcutt pat. of '81) were made in all respects as shown in that exhibit, except that it had two less teeth than it now has, and the spaces between the

remaining teeth were correspondingly increased, would the cutter, in your opinion, be or be not materially impaired in its efficiency and the quality of work it would perform?

Ans. I don't think it would be materially impaired.

Cross-int. 157. Suppose there were four teeth less, and the other conditions stated in the preceding question were the same, what would be your answer?

Ans. My answer would be that the cutter is impaired more than it was by the removing of two teeth. My reason for believing this is that if all the teeth were removed from the cutter except four, more or less, that it would be practically impossible to trim a shoe sole with such a cutter.

155 Cross-int. 158. Do you think there is any fixed rule in the construction of Orcutt's cutter in the relative proportions of the space between the teeth, the distance between the cutting edges of the teeth, the extent of top surface upon the teeth, and the angle between such top surface and the flat front face? If you think there is any such rule by which the best results can be obtained, please to describe the rule.

Ans. In the constructing of the Orcutt cutter I have no doubt that they have adopted the best possible means to them known for the manufacturing of such cutters, both as regards economy and excellence of workmanship. It is well known that the distances between the teeth in the first process of making such teeth are equal to the thickness of the milling-cutter by which this process is performed; again, in bending back the tooth in the process of rendering its top face eccentric to the axis of the cutter and in grinding the flat front face to the required rake, the result of which gives the spaces between the teeth, and I have no doubt that, were it practical to do so in the process of manufacturing these cutters, they would have the space between the teeth less than shown in the exhibit. This, I think, will make clear the rule which governs them in the width between the teeth of the Orcutt cutter. The rule by which the rake of the flat front face and the angle formed by the flat front face and the top molded face was no doubt determined by experiment under different conditions of speed of the cutter and the stock to be operated upon with the following objects in view: First, that the rake of the front face should be such and the angle formed by the flat front face and top molded face such that there should be a sufficient tendency by the rake of the tooth to draw the shoe sole against it, and yet not be liable to take the shoe from the operator's hands during the operation of trimming, the angle formed by the flat front face and top molded surface such as to give the right degree of rankness or depth of chip. The rule by which the extent of the top surface of the tooth was determined was by making as many teeth in the cutter and have sufficient strength at the base and as great an extent of wearing surface during the process of sharpening as was attainable under the conditions related in my answer.

Cross-int. 159. Have you given the most definite answer you can to the preceding question?

Ans. Yes I have, in relation to the rule of the construction of the Orcutt cutter.

156 Cross-int. 160. Do you think it would be practicable to trim leather of fair quality with Compl'nts' Exhibit Brown Patent Gear Cutter, either in the condition in which it now is or when it was well sharpened?

Ans. I do not.

Cross-int. 161. Do you think it would be practical to trim leather with cutters like Def'ts' Exhibit Colt's Armory Cutter No. 4, when well sharpened, if the teeth were entire?

Ans. Not if considered in the sense in which shoe-trimming is done.

Cross-int. 162. You have spoken repeatedly of the guard which the top surface of the teeth in Orcutt's cutter affords when trimming sole edges. Suppose a sole edge to be trimmed with a true and perfect outline, but projecting an eighth of an inch farther from the upper than was desired, do you think that eighth of an inch could be trimmed off with an Orcutt cutter by merely pressing the sole edge against it with the necessary force, or would it require skill and care in the operator to prevent the cutter from rendering the sole uneven while reducing it to the extent stated?

Ans. Under the conditions named in your question an eighth of an inch might be taken off in the operation of passing the shoe under the cutter at a proper rate of speed as to allow teeth enough of the cutter to pass over each part of the sole and to remove as many thicknesses of cut as would equal the amount desired to be removed. In the process of trimming the shoe sole skill on the part of the operator is necessary to prevent gouging.

Cross-int. 163. If the guard governs the depth of the cut and the sole is pressed constantly to the cutter, what danger can there be of "gouging," as you term it?

Ans. For the reason that the shoe is not passed under the cutter at a regular rate of speed, and consequently there is time for the cutter to remove more chips at one part of the sole edge than at another, which would consequently produce a wavy or gouged appearance.

Cross-int. 164. Suppose the shoe to be passed along the cutter at a uniform speed, but with an uneven or varying pressure, will the sole edge then be trimmed true or uneven?

Ans. That would depend upon several conditions. If the pressure was great and the material operated upon soft I have no doubt there would be a wavy surface produced. What I mean by

157 great pressure of the shoe sole against the cutter is a sufficient pressure to indent the teeth of the cutter into the sole while the cutter is not in motion; therefore the firmer the material the greater pressure may be admitted without producing a wavy surface.

Cross int. 165. In order to produce action of the cutter upon the shoe sole must there not always be sufficient pressure upon the cutter to indent the teeth into the sole? How else could the teeth act?

Ans. It is not necessary, in my opinion, that there should be suffi-

cient pressure exerted against the cutter during the operation of trimming to make any perceptible impression upon the sole edge while the cutter is not revolving. This will be clear when we remember that the rake of the flat front face of the tooth is such as to draw the shoe against the cutter during the operation of trimming.

Cross-int. 166. Did you understand the last question to relate to the operation of the cutter when it was revolving or when it was not revolving?

Ans. I understood it to relate to a cutter when revolving.

Cross-int. 167. Why, then, do you evade it by talking in your answer about a cutter when it is not revolving?

Ans. That I might more clearly answer your question as to what the result would be under varying pressures of the sole edge against the cutter in regard to gouging or producing a wavy surface.

Cross-int. 168. Will the rake of the teeth in Orcutt's cutter maintain the cut in the sole unless there is constant pressure exerted on the shoe during the operation of trimming?

Ans. I think it will not.

Cross-int. 169. Must not that pressure be sufficient always to sink the teeth into the sole?

Ans. Yes; if the cutter is revolving, and no if the cutter is standing still.

Cross-int. 170. And if the cutter was revolving the result of the pressure would depend upon both the quality of the leather and the greatness of the pressure—that is, the depth of the cut would be affected by those two causes, would it not?

Ans. It would to a certain extent be so affected, and the greater the extremes of pressure and softness of the leather the greater the effect would be.

158 Cross-int. 171. Please examine Exhibit Orcutt Patent No. 212,971 and state whether, in your opinion, the same does or not exhibit the same rake of the front face of the teeth as is shown in Exhibit Busell Cutter (Orcutt pat. of '81) and in Exhibit Orcutt Patent 238,303 of '81.

Ans. In the Orcutt patent 212,971 I do not find any special angle specified, but by comparing the Exhibit Busell Cutter (Orcutt pat. of '81) with the drawing I can discover no material difference in the rake of the flat front face of the tooth.

In the patent 238,303, the only figure in which the whole cutter is shown being perspective, it is impossible to tell with any accuracy by any means I have at hand as to how near the angles of the other patent and the exhibit cutter referred to may be alike, but I should judge from examination there is not much difference.

Cross-int. 172. Please answer the same question with reference to the molded top face of the teeth—that is, whether you find any difference in the cutters shown in the two patents or between the earlier patent and the exhibit cutter.

Ans. In the Orcutt patent 212,971, which shows the process of making the cutter, it is difficult to tell whether the eccentric form of the top face in relation to the center is the same as in the Exhibit

Busell Cutter (Orcutt patent of '81), as that eccentric form would depend upon the amount the tooth was bent back in the process of making.

In the other patent referred to it is impossible to determine as to the points in question for the reason before stated.

Cross-int. 173. Do you find in the Orcutt patent of 1879 and the patent of '81, now in suit, any substantial or material difference in any matter about which you have testified during this examination? If you think you find any such difference please specify it as clearly as you can.

Ans. I do not find any such difference as called for in the question.

(Noon recess.)

Redirect examination by Mr. MAYNADIER:

Int. 174. In order to relieve your opinions as to the milling-cutters and the rotary sole-edge trimmers from all doubts that
159 may arise from the long cross-examinations, please compare again the milling-cutters shown by Exhibits Milling Cutter, Brown & Sharpe Milling Cutters 1 and 2, Colt's Armory Cutter, and Colt's Armory Cutter No. 4, and Brown Patent Gear Cutter, and the rotary sole-edge trimmers shown by Exhibits Orcutt Cutter, 1st style; Busell Cutter (Orcutt pat. of '81), and defendants' cutters, and state their substantial differences, considering them first just as they lie on the table before you and stating how they would strike a mechanic skilled in metal-working and not skilled in edge-trimming, and then how they would strike a mechanic skilled in edge-trimming and not skilled in metal-working.

Ans. In considering the Exhibit Cutters now before me they would all be considered rotary cutters, but adapted for different purposes, and the impression made upon a person skilled in the art of metal-working in regard to the Exhibit Metal Milling Cutters would be that they are well adapted for the purposes for which they were intended, so far as rapidity and excellence of workmanship are concerned, while operating upon metals, it being, of course, understood that some of these cutters have much more strength and therefore capable of doing their work more rapidly than are others of the same lot. The Exhibits Colt's Armory Cutter and Colt's Armory Cutter No. 4 are examples where greater care in their operation is required by the workman than would be necessary in the case of the Exhibits Milling Cutter, Brown & Sharpe Milling Cutters No. 1 and No. 2, and Brown Patent Gear Cutter. It will be noticed in these milling-cutters that the teeth are as short and stout as is practical to make them consistent with the forms required upon the periphery and a proper convenience for sharpening. It will also be noticed that in the backing off or clearance of the teeth that it is done as much as would be consistent with a proper amount of strength for the tooth, and for the last-named reason, that of strength of the tooth, are the teeth made as short as is practical. It will also be understood that these cutters are designed to rotate at a very slow rate of speed and

with as much power as is practical and consistent with strength of the teeth.

In the mind of a person unskilled in metal-milling, but skilled in the art of trimming shoes, these milling-cutters would, on account of the shape of their teeth and their relation to each other,
160 be considered unfit for the purpose of trimming shoes or cutting leather, even were they driven at a high rate of speed.

In the Exhibit Rotary Edge Trimmers the impressions made upon the mind of a person skilled in metal-milling would be that they are entirely unfit for such a purpose, for the following reasons: The length of the teeth is too great; the rake of the front face of the tooth is reverse from that which it should be for the purpose of metal-milling; that part of the molded face which forms the rand lip should be made much thicker and thereby get greater strength, as will be clearly understood by referring to Exhibit Brown & Sharpe Milling Cutter No. 2. Another noticeable difficulty in these edge-trimmers, with the exception of Orcutt's Cutter, 1st style, is that there is not clearance enough given to the top face of the tooth for successful milling purposes. The impression that would be made upon the mind of one skilled in edge-trimming would be that they are well adapted for such purpose, the reasons being that the teeth being made long and the rake of the front face and the angle formed by the flat front face and top of the tooth is such as to present a proper cutting edge both in rankness and rake, and the molded form of the tooth is such as to finish the rand, bead, and bed of the sole, and also make parallel the two corners of the sole, the rand lip being sufficiently thin and yet sufficiently strong to perform the functions of finishing the rand, if provided with a guard to protect the upper of the shoe during the operation of trimming.

(The foregoing question and answer are objected to for the reason that it is an attempt on the part of the counsel for complainant to reopen the examination-in-chief, and that the subject-matter testified about in the answer was gone over by the witness in his examination-in-chief. The answer is further objectionable, even if it were in order, in that this witness has qualified as an expert in the matter of constructing or using rotary metal milling-cutters or in trimming shoe soles with rotary cutters; but, on the contrary, his testimony, taken all together, shows that he cannot qualify as an expert in trimming shoe soles with rotary cutters, and especially so with the Orcutt cutter, as it plainly appears that his only experience therewith consisted in experiments on leather and pieces of wood. The evidence is further objectionable in that it seeks at the end of an ex-
161 amination to permit the witness to state upon the record the information that he has derived from the counsel for the complainants at repeated interviews during the progress of the examination. Counsel for defendants having fully examined the witness upon all matters introduced in the examination-in-chief, and as it is not attempted to review that matter, but only to reopen the examin-

ation-in-chief by the last question, further examination on behalf of the defendant is waived.)

FRED'K W. COY.

Attest: WM. A. COPELAND,
Special Examiner.

BOSTON, *Feb.* 16, 1885.

Present: Counsel as before.

Complainants put in evidence a certified copy of agreement between William D. Orcutt, James H. Busell, and the Busell Edge Trimmer Co., dated Dec. 1, 1879, recorded in the United States Patent Office, Liber T[26], page 390, and marked Complainants' Exhibit License 1, W. A. C., sp'l ex'r; and certified copy of agreement between J. H. Busell, William D. Orcutt, and the Busell Trimmer Co., dated Dec. 20, 1880, recorded in the United States Patent Office, Liber T[26], page 394, and marked Complainants' Exhibit License 2, W. A. C., sp'l ex'r.

Also copies of the following patents, marked as Complainants' Exhibits in this case:

U. S. letters patent—
No. 10239, to J. H., J. M., & J. Q. Thompson, Nov. 15, 1853.
No. 15176, to I. A. Dunham, June 24, 1856.
No. 97758, to R. F. Burns, Dec. 14, 1869.
No. 127,904, to J. W. Maloy, June 11, 1872.
No. 131,140, to H. F. Wheeler, Sept. 3, 1872.
No. 137,066, to B. Gallagher and J. Coyle, March 25, 1873.
No. 173,830, to N. S. Thompson, Feb. 22, 1876.
No. 152,728, to Davis & Howe, July 7, 1874.
No. 193,347, to G. F. Read, July 24, 1877.
No. 198,234, to J. E. Young, Dec. 18, 1877.

162 Also English letters patent No. 746, of 1866, to Charles Linford.

No. 220, of Jan. 23, 1869, to Mountain, Richmond, and Duffield.

Two cutters marked Complainants' Exhibit Burr Cutters.

Also a price-list marked Complainants' Exhibit Price List, W. A. C., sp'l ex'r, and a cutter marked Complainants' Exhibit Round Rand & Edge Trimmer.

It is admitted by the defendants that Complainants' Exhibits Defendants' Cutters and Defendants' Cutters S 80 were made by the defendants since the date of Complainants' Exhibit Orcutt Patent in suit (No. 238,303, March 1, 1881) and before the filing of the bill, and are such as the defendants are now making and selling.

Complainants also put in evidence a certificate of incorporation marked Complainants' Exhibit Certificate.

Attest: WILLIAM A. COPELAND,
Special Examiner.

Deposition of O. L. Noble.

BOSTON, *Feb.* 16, 1885.

It is agreed by counsel that the following statement of Mr. Noble in narrative form be taken as his testimony on direct examination:

OSCAR L. NOBLE, of lawful age, says: I am general manager of the Busel Trimmer Company and have been since its organization, in 1880. That company is the successor of the Busell Edge Trimmer Company, organized in 1877, and I was also general manager of that company during its whole existence, except for a few months, when I was in the West. I commenced the manufacture and sale of machines for trimming sole edges in 1875 in connection with James H. Busell, who had invented a machine for that purpose. My chief business since 1875 up to the present time has been and now is the manufacture and sale of machines for finishing the edges of soles, and I am practically familiar with all machines of that class which were in use prior to 1875 and which have been used since. I have also made a study of patents for machines of this class, including patents of foreign countries, as well as those of the United States, and also including all patents relating to parts of such machines, as well as patents which are strictly for such machines.

163 The machines in use in 1875 were mainly of the kind called the Coté machine, but only to a limited extent, for I feel sure that less than seventy-five in all were sold, and of these only a small portion remained in practical use in 1875. A few Hodges machines, so called, were put out prior to 1875, but none of them were used practically except for a short time, and I cannot now recall one in use in 1875. A few Tayman machines, so called, were also put out before 1875, and were used several years, but not more than twenty-five were ever in practical use.

All of the machines made what are called plain edges, and none of them were adapted to making what are called fancy or moulded edges; and, moreover, the edges trimmed upon all of these machines required to be gone over by hand in order to complete the trimming.

Of these three machines the Coté and Hodges used rotary cutters, while the Tayman used a non-rotary cutter; but the Tayman alone used a welt knife—that is, the cutter used in the Tayman trimmer consisted of two blades, one of which trimmed the sole edge, while the other cut off that corner of the sole edge next the upper, which is usually called the welt or rand, and by welt knife or rand knife is meant the cutter which trims off that corner of the sole edge. This style of cutter was never used to any great extent, and is not now used at all in trimming machines.

The Hodges machines were defective in principle, and also because the rotary cutters used were unpractical.

The Coté machine, when first put upon the market, used the burr-cutter, so called, samples of which I produce, marked "Exhibit Burr Cutter."

These were the only practical cutters used in rotary trimming machines up to 1874, so far as I know or have any reason to believe after a very thorough and careful investigation of the matter, that investigation having been made not for the purposes of this case but during 1875, 1876, and 1877, when I was more particularly engaged in acquiring full information as to this art.

The burr-cutter was objectionable, because it required to be so very hard when used as a cutter that it was necessary to soften or anneal it when it required to be sharpened and to harden it again after it was sharpened. Moreover, it was only practical for plain edges.

164 The next cutter in order of time and the best cutter of its day was the cutter patented in 1874 (No. 157,476, December 8) by J. C. Knights. This cutter was used in the Coté machine, and hence is commonly called the Coté cutter. See "Exhibit Coté Cutter, Knights' patent." This cutter would make not only a plain edge but also a concave edge, and was much more easily sharpened and did better work than any prior rotary cutter. It superseded the burr-cutter entirely and was in general use on the Coté machine from 1874 till about 1877, when it was modified and greatly improved by making the blades separate from the hub, as in the cutter marked "Exhibit Old Busell Cutter," which was patented by Busell in 1878 (No. 210,006, Nov. 19) and first put upon the market by Busell and myself late in 1876, and then became known as the Busell cutter, because used upon the machine we then built, and which was known as the Busell trimmer. In 1877 the Busell Edge Trimmer Company succeeded to our business, and the cutters made by that company were all like Exhibit Old Busell Cutter, except a few at the first like Exhibit Coté Cutter, Knights' patent, the Busell Edge Trimmer Company making mainly cutters like Exhibit Old Busell Cutter, but making a sufficient quantity of the cutters like Exhibit Coté Cutter, Knights' patent, for use on the old-style machines, which were gradually replaced by the machines using the old Busell cutter.

By the middle of 1878 nearly all the old machines were replaced, and during the years 1874, 1875, 1876, 1877, 1878, and the fore part of 1879 practically all the shoes whose soles were trimmed by rotary cutters in this country were trimmed with the Knights cutter, by which I mean to include both styles, Exhibit Coté Cutter, Knights' patent, and Old Busell Cutter.

In the fall of 1879 the cutter now known as the Busell cutter, marked "Exhibit Busell Cutter" (Orcutt patent of '81), was first put upon the market, although we had commenced the manufacture early in the year 1879; yet in order to start at all we had to produce at least three styles and twenty-five sizes of each style. The cutter gave such satisfaction that in 1881 it was the standard cutter.

This cutter is the only rotary cutter ever used practically for fancy or moulded edges, and is, in my opinion, the only rotary
165 cutter now known practically adapted for that work. Up to Jan. 1, 1880, we sold 302. During the next six months, the first half of 1880, we sold 1,001; last half of 1880, 1,362; first half

of 1881, 2,627; last half of 1881, 4,438; first half of 1882, 5,403; last half of 1882, 5,822; first half of 1883, 7,486; last half of 1883, 8,944; first quarter of 1884, 5,118.

Moreover, these cutters have always been sold at three dollars each, with only small discounts not over five per cent. to any user, when ordered in large quantities and the regular trade discount of fifteen per cent. to dealers. I speak now of the price of fore-part cutters. The shank cutters are sold at two dollars each, with the same discount.

Over 40,000 of these cutters made under the patent in suit have been sold, and the boot and shoe manufacturers have paid for them upwards of $120,000, and with them they have trimmed not less than 150,000,000 pairs of shoes, for one cutter will trim 5,000 pairs of shoes, with ordinary care in its use, and often over 10,000 pairs will be trimmed with one cutter, and the average is certainly not less than 4,000 pairs per cutter. I have no doubt that it would cost at least one half a cent more per pair to do the work done by these cutters in any other way, and that the saving to the public up to April 1, 1884, by the use of the cutters described in the patent in suit is considerably more than one-half a cent a pair on 150,000,000 pairs, which is $750,000.

I testified as a witness on behalf of the complainants in the suit No. 1673, Busell Trimmer Company *et al. v.* Corthell Manufacturing Company *et al.*, and was present when the witness in that suit testified on behalf of the defendants, and am familiar with all the cutters set up in that suit as anticipations of the Orcutt invention. Moreover, I had been familiar with them long before that suit was brought.

An attempt to produce a rotary cutter for trimming sole edges which would do the work done by the cutter described in the patent in suit was made by Samuel N. Corthell, one of these defendants, in 1878, and his cutter is shown in the sample marked "Exhibit Corthell Patent Cutter, patent No. 207,395, Aug. 27, 1878." This cutter I thought well of at first, and I personally ordered from David Whittemore enough of them to test their practical use-
166 fulness; and they were made for me by Frank M. Stevens, also one of the defendants, then employed by Whittemore. I took a great deal of pains with this style of cutter, but found that, while it did its work well, the practical objections to it were so numerous that it was practically worthless.

The demand for a rotary cutter for trimming sole edges was as great in 1875, when I first went into the business, as it ever has been since, and the main objection to the edge-trimmers in use before 1875 was that the cutters were very limited as to the style of edges that could be made with them. I except the Hodges machine from this statement, as that was wrong in principle and also had a very defective cutter.

The progress of invention of rotary cutters for sole edges has been gradual. First, the old burr-cutters, which took off only the edge proper (that is, the leather between the upper and lower surfaces of

the sole), did that work indifferently and required the use of a welt knife and spoke shave to finish the edge.

The first advance on this was the Tayman rotary cutter, patent No. 136,790, March 11, 1873; reissued, No. 9073, Feb. 10, 1880. This was a burr-cutter made up of two ordinary burr cutters and a third burr-cutter with the cutting edges of its teeth inclined to the axis, the three cutters being close together on the same shaft and forming one single cutter, which not only took off the edge proper but also took out the rand. This is the first rotary rand knife or welt knife of which I have any knowledge or information, and I have no doubt this is the first one produced. All modern rotary cutters resemble the Tayman in having this rotary rand knife.

In Tayman's rotary cutter the rand knife was a burr-cutter, and was not one piece with the rest of the cutter. In 1874 Davis and Howe obtained their patent (No. 152,728, dated July 7) for a rotary cutter having two blades inserted in the rand guide to form a rotary rand knife, but in this cutter rand knives were blades which required to be fastened in place by screws, and the cutter was otherwise impractical.

The Busell Company own both these patents, and they bought them for the sole reason that they are the first patents issued in this or any other country which show any form of rotary rand
167 knife. So far as I am able to understand this matter, I have no doubt that a rotary rand knife is not only an invention, but one of very high rank, for although rotary cutters had been used for many years before 1873, yet a rotary cutter adapted to run between the sole and upper and take out the rand was unknown before Tayman's invention.

The Busell patent No. 167,874, Sept. 4, 1875, is the next patent which shows a rotary rand knife. This rand knife was similar to Davis and Howe's, but an improvement on theirs. The machines shown in this patent were the ones I first built, but were not put on the market with a stationary rand guide in the form shown in that patent, but with a rotary rand guide as in Busell's patent No. 188,337, dated March 13, 1877.

The rotary cutters used in these machines were like Exhibit Old Busell Cutter, and hence these machines were limited to three styles of edges, what are known as straight, medium concave, and full concave, and the rand knives were necessarily separate from the rest of the cutter.

The first rotary rand knife in one piece with the cutter of which I have any knowledge or information is that shown in the patent in suit, but about that time I also saw the cutter described in Corthell's patent No. 207,395, Aug. 27, 1878. On testing this cutter I found it unpractical, not only because of the very great difficulty of making the lip (as the rand knife is now commonly called when made in one piece with the rest of the cutter) of the desired height and angle, but also because the front face of the lip on one tooth would come in contact with the rear face of the next tooth if made long enough to give the required height of the lip.

The rotary rand knife shown in the patent in suit is the only prac-

tical rotary rand knife in one piece with the cutter that I ever saw or heard of. It is also the only rotary rand knife which can be ground on the front face.

Certain parts of the cutter in suit are called commonly the lip, the bed, and the guard, and there is often a bead, sometimes upon the lip, sometimes upon the bed, and sometimes partly upon both, and also a channel guard, which is the raised portion of the guard. These terms are all taken from the old hand plane, marked "Exhibit Hand Plane."

168 I was familiar many years before 1858 with metal working cutters, and know that great numbers of them and very great variety of styles were made and used before that time under Brown and Sharpe patent, No. 45294, dated Nov. 29, 1864, a sample of which is marked "Exhibit Milling Cutter." I also believe that the cutter described in the patent in suit infringed that patent, and therefore took a license under it, which remained in force until that patent expired. I have personally examined a great many different styles of these milling-cutters, and while I have often seen metal working cutters with what might strictly be called a bed and a guard, yet I never have seen one with a lip—that is, with the ridge marked 1 in the patent in suit, nor did I ever see one with what, in my opinion, could be fairly called either a lip or bed or guard, a bead or a channel guard, or that could be used practically on sole edges.

The lip on a rotary sole-edge cutter must be so thin and slight at its apex that it can be used with a rand guide like Exhibit Rand Guide, because both the lip and the rand guide must go between the sole and the upper, as the function of the lip is to cut off more or less of the upper corner of the sole. As the style of the sole edge depends wholly upon the relation between the lip, the bed, and the guard and the size of these parts, there must obviously be the same rules as to proportions of the lip, bed, and guard, and also as to the bead and channel guard when used, applied to the rotary cutter as are applied to the hand plane, and Orcutt is the first, so far as I know or have any reason to believe, who ever made a rotary cutter by applying these rules. It is true that similar rules must be applied in making the cutter of Corthell's 1878 patent; but the moulded portions of the teeth of the cutter of Corthell's 1878 patent must be, nevertheless, very different from the moulded portions of the hand plane and from the moulded portions of the cutter of the Orcutt patent in suit.

In my opinion, it is clear that the cutter of the patent in suit is a radical novelty, because it is the first cutter ever known made up of a series of hand planes arranged around a common axis, the guards of the plates being omitted for the reason that the rear portion of each blade (or tooth) of the rotary cutter forms a guard for the cutting edge of the next blade or tooth—that is to say, the hand plane consists of a guard and a blade, and if a series of these planes

169 were arranged around a common axis a rotary cutter substantially the same as the cutter of the patent in suit would result.

It seems to me that Orcutt's invention may be fairly described as

that improvement over the hand plane which adapts it to be used in a machine instead of by hand, and that this is a much fairer way to look at the matter than to call the invention a mere double use of the milling-cutters on sole edges.

I can readily see that after a machinist who was familiar with milling-cutters had thought of improving the hand plane by arranging a series of them around an axis he would see on reflection that the best way to embody this wholly new idea was to imitate the milling-cutters as closely as possible and yet preserve all the features of the hand plane; but, nevertheless, it seems clear to me that there is invention of a very high rank in the conception of thus adapting the hand plane for use in a machine instead of by hand.

On looking carefully at the hand plane it will be seen that the lip differs radically from the lip of the cutter of the patent in suit, not only in that the latter is a series of ridges arranged about a common axis, but also in that the rand guide of the hand plane is wholly different from that used with the rotary cutter, for the apex of the lip of the blade of the hand plane is prevented from injuring the upper by the shape of the outer surface of the ridge which forms the lip, and not by a separate rand guard, which is essential in all rotary sole-edge cutters.

The manner of using the milling-cutters is wholly different from that of using the rotary sole-edge trimmers; first, because the metal operated upon by the milling-cutter is always rigidly held at the proper distance from the axis of the cutter, and this cannot be done in sole-edge trimming, for the shoe is always held in the hands of the operator and presented to the cutter, the contact being very light, and the operator drawing the shoe towards him and taking care not to keep any one part of the sole edge in contact with the cutter for any large fraction of a second.

The tendency of the milling-cutter is to force the metal acted upon away from the axis of the cutter, while the tendency of the sole-edge cutter is to draw the shoe towards the axis.

The sole-edge cutter must revolve to do passable work upwards of
5,000 times per minute, and in practice they will average over
170 6,500. The machines are belted to give a speed of 8,400, but
the actual speed is probably about 7,500, owing to the slip of the belts, while the milling-cutter revolves from 300 to 500 times per minute.

The heel of each tooth in the sole-edge trimmer acts as a guard, much the same as the guard upon the hand plane, and no such action as this is possible in the milling-cutter.

The two cutters marked Exhibits "Defendants' Cutters" are samples of those now put upon the market by the defendants.

The meaning of the special marks on all the molded cutters produced is as follows: No. 4 means that the bed is four forty-eighths of an inch in width; S. 81 refers to the catalogue, in which the styles are shown each by a cut and a number; $1\frac{1}{2}$ means that the lip is one and a half thirty-seconds or three sixty-fourths of an inch high; 26 means the angle which the lip makes with the flat side of

the cutter. In the half-round cutter, one of the two marked "Defendants' Cutter," the measurements of forty-eighths of an inch *is* not observed, but these cutters vary by certain established sizes called "1, 2, 3, 4, etc., half rounds;" 60 in this cutter refers to the angle of the lip and means sixty degrees less than a right angle—that is, thirty degrees.

In the cutters marked "Exhibit Busell Cutter, Orcutt patent 81," No. 12 means twelve forty-eighths of an inch bed; S. 63 refers to the price-list of the Busell Company, now produced and marked "Exhibit Price List;" 2½ L. 26° means that the lip is two and a half thirty-seconds of an inch high and on an angle of twenty-six degrees from the flat side of the cutter.

We have about eighty other styles not shown in our price-list, and we have not less than 5,000 varieties, reckoning each change of lip, bed, bead, and guard as a variety. For example, style 40 in our price-list will include over one hundred different varieties.

The Tayman welt or rand knife, marked F^2 in the Tayman patent, is, I have no doubt, the first rotary welt knife ever known, and in my opinion the rotary cutter described in the Orcutt patent in suit and the cutters made by the Corthell Company and by both parties to this suit contain a rotary welt knife substantially the same as the rotary welt knife F^2 of the Tayman reissue—that is to say, the ridge marked 1 in the Orcutt patent in suit, and which ridge is in all the cutters in suit, is, in my opinion, substantially
171 the same as the Tayman cutter F^2, and when used with the rand guide, as it is always used, makes the rotary tool for trimming welts which is described in the Tayman patent; but the rotary cutter for sole edges described in the Orcutt patent in suit is, nevertheless, in my opinion, substantially different from and vastly superior to the rotary cutter for sole edges described in the Tayman patent, for the Tayman cutter consists of two common burr-cutters, FF^1, and the rand-cutter F^2 has all the objections of the burr-cutter and lacks the guard, the bead, and the channel guard, while the Orcutt cutter has a rand lip and bed, and in addition has a guard. Moreover, it can be as readily made with a bead and a channel guard as without, and it is the first rotary cutter ever made having a rand lip, or a bed, or a guard, or a bead, or a channel guard which can be ground upon the flat front face and keep its shape and size when ground.

I will now consider the patents set up in the answer.

(1.) No. 45924, to J. R. Brown, Nov. 29th, 1864, is the Brown & Sharp gear-cutter, and lacks the bed, the bead, the rand lip, the guard, and the channel guard, and never has been used for trimming sole edges.

(2.) No. 157,476, to James C. Knights, dated Dec. 8th, 1874, is the cutter used upon the Coté machine. It has a bed, but lacks the rand lip, the bead, the guard, and the channel guard. In practical use it was nearly always used without a rotary rand knife until made as shown in Exhibits Rounds' Rand and Edge Cutter and Thompson's Rand and Sole Edge Trimmer, about 1876. The two cutters, Exhibit Coté Cutter (Knights' patent) are Knights cutters, one adapted for use

with a rand knife; the other not; and the cutter marked Exhibit Old Busell Cutter is also substantially the same as the Knights Cutter, but with a groove for the rand knife. These cutters, including the cutter described in the Knights patent, and also including Exhibits Coté Cutter (Knights' patent), Old Busell Cutter, Rounds' Rand and Edge Cutter, and Thompson's Rand and Sole Edge Trimmer, are none of them adapted for moulded or fancy edges, and none of them have a rand lip, bed, and guard formed in one blade or tooth. Only one of them has a bead, Thompson's rand and sole-edge trimmer, and that has a very defective bead, and none of them can be sharpened on the front face. They are all, in my opinion, radically
172 different from Orcutt's cutter in all substantial respects, and yet they fully show the state of the art of rotary edge-trimming at the time when Orcutt's cutter came into the market and superseded them all, for the reasen that Orcutt's cutter was adapted to do all the work that could be done by any of them, and was adapted to do all varieties of fancy or moulded edges besides, and, moreover, could be readily sharpened, one sharpening sufficing for the rand lip, bead, bed, guard, and channel guard, and there being no danger of changing the shape or size of the cutting edge by sharpening.

In the Exhibit Thompson Rand and Sole Edge Trimmer, for example, the rand knife was sharpened by itself, the Knights cutter, making a part of that exhibit, was sharpened by itself, and the sleeve was sharpened by itself, that exhibit being selected because it is substantially the same as the cutters described in Busell's patent, No. 188,337, dated March 13th, 1877, and Bolling's patent, No. 192,616, dated July 3d, 1877; and these cutters were the nearest approach to a good rotary cutter for sole edges made before Orcutt's invention. I do not mention Corthell's cutter of patent No. 207,395 as part of the state of the art, because it never came into use and is not a practical cutter for sole edges or for any other purpose.

(3.) No. 207,395, to Sam'l N. Corthell, dated Aug. 27th, 1878. This cutter is the one I have just mentioned; it is shown in Exhibits Cutter Corthell Patent No. 207,395 and Corthell Patent Cutter (pat. No. 207,395). This cutter has a rand lip, a bead, a bed, and a guard, and may be made with a channel guard, but it is nevertheless wholly different from Orcutt's cutter, in my opinion, and, as I have before said, is practically worthless. It will do good work on some classes of edges, and possibly, had it not been for Orcutt's invention, might have got into limited use, but it is so much more expensive to make and is so much more difficult to sharpen than Orcutt's cutter that it is wholly worthless in comparison with Orcutt's cutter, and was abandoned as soon as Orcutt's cutter became known. In the spring or early summer of 1878 I had several made, as I have before stated, and had them used to test their merits; but none of them were ever sold, so far as I know, and I am certain that I should have known it had any one ever been sold. Less than a dozen in all were ever made, to my knowledge or so far as I have any reason to believe, for I stopped all work upon them for the

Busell Company soon after I saw Orcutt's cutter, and all
173 that were ever made were for the Busell Company, except a few made for the Coté machine. Exhibit Corthell Patent Cutter (pat. No. 207,395) was made for me, and Exhibit Cutter Corthell Patent, No. 207,395 was made for the Coté machine; neither of them has ever been sharpened since it was tempered.

(4.) No. 212,971, to William D. Orcutt, dated March 4th, 1879. The cutter shown in this patent is the same as that shown in the patent in suit. The applications for both patents were filed on the same day, January 6th, 1879, and patent No. 212,971 is for a method of making the cutter which Orcutt invented shortly after he had made his first cutters with inserted blades.

(5.) No. 97758, to R. F. Burns, dated December 14th, 1869, is for a rotary burnisher and does not describe a cutter of any kind.

(6.) No. 136,790, dated March 11, 1873, reissued, No. 9073, February 10th, 1880, to Benj. J. Tayman. This is the bottom patent on the rotary rand knife, but the cutter is a burr-cutter, made up of three separate burr-cutters, each requiring to be sharpened by itself. It has a rand lip and bed, but no bead, guard, or channel guard. It will do all the work done by the Knights cutter, Exhibits Coté Cutter, Knights' Patent, Old Busell Cutter, and Rounds' Rand and Edge Cutter, but is inferior to those exhibits for practical use, and like them is limited to plain edges, and like them is also inferior to the cutters shown in Busell's patent, 188,337, Bolling's patent, 192,616, and Exhibit Thompson's Rand and Sole Edge Trimmer. The only advantage of the Knights cutter used with a rotary rand knife, as in Exhibit Rounds' Rand and Edge Cutter, over the Tayman cutter is that the later is more expensive to make and more difficult to sharpen.

(7.) No. 167,874, dated Sept. 21st, 1875, reissued; No. 8239, May 21st, 1878, to James H. Busell. The cutter described in this patent is a burr-cutter with a groove across one end to receive the rand knife, the groove and rand knife being same as Exhibit Rounds' Rand and Edge Cutter, although the Knights cutter in that exhibit is far better than the burr-cutter of Busell's patent, 167,874. This cutter was not adapted for fancy or moulded edges, and was wholly superseded by the Knights cutter with a groove for the rand knife, as shown in one of the two cutters marked Exhibit Coté Cutter (Knights' patent) and in Exhibit Old Busell Cutter.

174 (8.) No. 152,728, July 7th, 1874, to Davis and Howe. This is a crude cutter, consisting of knives clamped between two plates, one of the plates being a rand guard and having two welt knives secured each by a screw. This cutter is worthless in comparison with the Knights cutter grooved to receive a rand knife, and never got into use.

(9.) No. 188,337, dated March 13th, 1877, to James H. Busell. This cutter is a Knights cutter, but with the blades in planes across the axis, a welt knife in a groove across an end of the Knights cutter, and a spring sleeve with cutting teeth upon it, in substance the same as Exhibit Thompson's Rand and Sole Edge Trimmer. The Knights cutter with the rand knife and the toothed sleeve

was largely used at and before the time when the Orcutt cutter was put upon the market, and was indeed at that time the standard cutter of the Busell Trimmer Company, but has been superseded by the Orcutt cutter. In the patent 188,337 the rand knife and rand guard are shown upon a small spring shaft, E, while the Knights cutter and sleeve are on the main shaft. We made a good many machines in that way, but in the bulk of our machines we put all these four parts, the rand guard, rand knife, Knights cutter, and sleeve, on the main shaft, not using the small spring shaft E, and in these machines the cutter and rand guard were not only substantially the same as the Bolling cutter patent No. 192,616 and Exhibit Thompson Rand and Sole Edge Trimmer, but were precisely the same except as to details of construction, except that the number of teeth in the sleeve and the strength of the spring in Exhibit Thompson's Rand and Sole Trimmer would make it worthless for practical use unless the teeth in the sleeve were so dulled that they could not cut, when it would be the same tool in substance as Exhibit Rounds' Rand and Edge Cutters.

(10.) No. 198,234, Dec. 18th, 1877, to J. E. Young, does not describe any cutter, but shows an edge-setting tool.

(11.) No. 127,904, June 11th, 1872, to James W. Maloy, does not describe a cutter, but an edge-setting tool.

(12.) No. 137,066, March 25th, 1873, to Gallagher & Coyle, shows a burr-cutter much like Tayman's (patent No. 136,790), except that it is in two pieces instead of three. It has a rand lip and a bed, but no bead, guard, or channel guard, and is not adapted for fancy or moulded edges. It is far inferior to the Knights cutter with a groove for the rand knife.

175 (13.) No. 131,140, September 3d, 1872, to Henry F. Wheeler, does not describe a cutter, but shows an edge-setting tool.

(14.) No. 192,616, July 3d, 1877, to Augustus Bolling. The cutter consists of a Knights cutter with a groove across it to receive a rand knife and a sleeve with teeth on one end, substantially the same as shown in patent No. 188,337, to James H. Busell, and much the same as Exhibit Thompson's Rand and Sole Edge Trimmer.

(15.) No. 173,830, to N. S. Thompson, February 22, 1876. This cutter is the same as shown in Knights' patent, No. 157,476, except that the spaces between the teeth are spiral instead of parallel with the axis of the cutter, but it does not differ in substance from the Knights cutter. It is a little more difficult to make and to sharpen and no better in use than the Knights cutter. It lacks the rand lip, the bead, the guard, and the channel guard.

(16.) No. 44688, to H. Hodge, Oct. 11, 1864, shows one form of the old burr-cutter, which was wholly superseded by the Knights cutters, Exhibits Coté Cutter (Knights' patent) and Old Busell Cutter.

(17.) No. 135,694, to Louis Coté, Feb. 11th, 1873, shows the old burr-cutter.

(18.) No. 193,347, July 24th, 1877, Geo. F. Read, describes an edge-setter of peculiar construction, but does not mention any sort of cutter.

(19.) No. 15176, to Isaac A. Dunham, June 24th, 1856, shows an old style of hand plane.

(20.) No. 879, to Pierre F. Gubault, March 14th, 1868, shows an old form of burr-cutter.

(21.) No. 746, to Charles Linford, dated March 12th, 1866, describes nothing intelligibly.

(22.) No. 2505, to J. J. Anderton, October 12th, 1863, describes (without a drawing) a circular metal-cutter or rasp having upon its circumference or edge a series of knives or cutters placed obliquely to its axis, from which I understand a metal hub with blades or knives fastened upon it in some way. Anderton also describes a rand guide provided with a series of small knives or cutters for cutting smooth the upper edge of the welt, but how these small knives are secured to the rand guide he does not say, and I cannot imagine.

176 This patent is the only hint of a rotary rand knife before Tayman's patent, and I have no doubt that it is impossible to build a cutter of any value by following the description contained in Anderton's patent.

(23.) No. 220, to Mountain, Richmond, and Duffield, January 23d, 1869, shows the ordinary burr-cutter.

I was familiar with all these patents several years ago, and it was by reason of my familiarity with them and with all the machines and cutters which have been produced since 1875 that I feel confident now and have long felt confident that no cutter was known before Orcutt's which was practically adapted for all classes of edges, including fancy or moulded edges, and that the enormous increase in the rotary trimming business since the middle of 1879 is due wholly to Orcutt's invention, and that the sole reason for the smallness of that business up to the middle of 1879 was the fact that no rotary cutter for sole edges was then in the market with a rand lip, a bed, and a guard.

I recognize, of course, that the spring sleeve with teeth on one end, shown in the Busell patent, 188,337, in the Bolling patent, 192,616, and in Exhibit Thompson's Rand and Sole Edge Trimmer, is intended to perform one function of the guard in the Orcutt cutter, but obviously this sleeve is very much inferior to the guard and radically different from the guard.

The Thompson patent, No. 10239, Nov. 15, 1853, shows a cutter in no way similar to the Orcutt invention, it having no head, lip, or guard, and being adapted to trim only a straight edge when used in combination with a pattern plate attached to the bottom of the shoe sole and adapted to run against a guide bar to determine the depth of the cut, and was, in my opinion, wholly impracticable as a machine.

(Cross-examination waived.)

O. L. NOBLE.

(Adjourned.)

Attest: WM. A. COPELAND,
Special Examiner.

177 *Evidence for Defendants,*

Taken pursuant to the 67th rule of the Supreme Court of the United States, in equity, as amended, before me, Eugene Humphrey, special examiner.

Present: T. W. Porter, Esq., of counsel for defendants; J. E. Maynadier, Esq., of counsel for complainants.

Deposition of Samuel N. Corthell.

BOSTON, *February* 23, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Samuel N. Corthell; 42 years of age; Quincy; salesman.

Int. 2. Are you familiar with shoe manufacturing; and, if so, how long have you been familiar with that art or trade? Please state fully and as concisely as you can.

Ans. I am. I commenced pricking holes and driving pegs into shoes when I was not more than nine or ten years old. I learned other parts of the trade as I grew older. I kept at the business until the war broke out, when I enlisted. After the close of the war the manner of manufacturing boots and shoes had changed from home shops and gangs to steam factories. I went to work in the factory known as "the King House," conducted by J. L. Nash & Co., at Abington. From there I went to Dunham's factory, in the same town. From there I went to work for Reed and Closson, at South Abington. Then to C. R. Ford's, at North Bridgewater (now Brockton). Then at L. Leach & Co.'s, Potter & Southworth's, C. F. Porter & Co., and Orr & Sears, at the same place. I then went back to C. R. Ford's, and from there went to work for the Union Ma-
178 chine Co. of New York, and afterwards for D. Whittemore, of Boston, selling, setting up, operating, and instructing others to operate edge trimmers and setters. I next took contracts to trim and set shoe edges for Reed & Jones, at Auburnville, in South Abington; also a contract for the same work at W. V. Everson's shop, at South Abington. I after that went to work for A. R. Jones & Co., in Boston, on a contract, and from there I went to work and got up what is known as "the Corthell trimmer," for trimming the edges of boots and shoes, and have continued in that line of business to the present time.

Int. 3. Are you familiar with the use and practical operation of all the rotary sole-edge trimming cutters which have been introduced into use to any material extent in this country?

Ans. I am.

Int. 4. Please state as briefly as you can the names, as generally known, of the different edge-trimming rotary cutters that have to a material extent been used in the trade.

Ans. Coté, Knights, Bolling, Busell, Corthell, Brown and Sharpe, Orcutt, and Stirckler.

Int. 5. Please state the principal characteristics of these several cutters without going into minute details, but such as will give a good general idea of their construction and mode of operation.

Ans. The Coté had a blade with a V-shaped edge, which is sharpened on both sides, front, and back, and operated by scraping the edge when revolved. This cutter trimmed a straight or concaved edge according to the shape of the cutter.

The Knights cutter had a chisel edge with a flat front face and back, and trimmed a straight or concaved edge according to the shape of the cutting edge.

The Bolling cutter consisted of two sections, one of which trimmed the channel or bottom of the sole and the other the bed, and had a countersunk end which took a plain rand guide. This would trim a square bed or a concave bed and the channel or bottom of the sole, and make what is known as the "bevel" and "square" edge and trim the sole to a uniform thickness. This cutter had also a flat front face and back.

The Busell cutter was a chisel-edge cutter, with an overhanging tooth which had three sections. It cut on the bottom or chan-
179 nel, the bed and the "rand," or upper edge of the sole. The teeth had a flat front face and back, which could have been ground on the front face, but were ground on the top or chisel edge.

The Corthell cutter had a moulded front face which would trim the channel, bed, bead, and rand, and was ground on the top of the tooth. It would trim any style or configuration of the edges.

The Brown and Sharpe cutter had the molded top on each tooth and a flat front face, which could be ground, and the top was cleared back to give it a cutting edge. This would trim all styles, the same as the Corthell.

The Orcutt cutter had a molded top surface and flat front face, the teeth being bent back for clearance and to give a cutting edge. This trimmed all different styles of edges, the same as the Corthell and the Brown and Sharpe.

The Stirckler cutter had a molded top surface and a flat front face, the top of the tooth being flat, and had to be ground on the front and back both. This would cut all the well-known styles of shoe edges, same as the Corthell, Brown & Sharp, and Orcutt cutters.

All these cutters were rotated upon an arbor, and the shoe was held in the hand and passed under them with the edge in contact with the cutter.

(Adjourned.)

FEBRUARY 24, 1885.

(Direct examination resumed:)

Int. 6. Please state the extent to which the Coté cutters were used and what led to their being superseded, if you know.

Ans. Their use was very limited. Operators commenced them-

selves to grind them on the top edge instead of filing off upon each side which made of them a chisel-edge cutter, afterward known as "the Knight's cutter," but commonly called the Coté, as before.

Int. 7. Please examine the cutters now shown you, marked "Complainants' Exhibit Burr Cutter," and state whether or not they correctly represent the cutter known as the Coté cutter.

Ans. They do not correctly represent the Coté cutter. The bottom of the slot was wider in the Coté cutter than in these. The complainants' exhibit, marked "Coté Cutter (Knight's pat.)," if the teeth were filed on both sides to a sharp top it would be a perfect Coté cutter.

180 Int. 8. To what extent was the Knights cutter used, or cutters substantially the same?

Ans. They were used from 1875 to 1878, and cutters substantially the same are used up to the present date. I should say they were used on two hundred or more machines.

Int. 9. What modifications, if any, were made of the Knights cutter? And if any exhibits of the same are before you please specify them in your answer.

Ans. The Bolling cutter had a channel-cutter used in connection with it, with a plain rand guide, as shown in patent No. 192,616, issued to A. Bolling July 3, 1877. In other respects it is the same as the Knights cutter.

Int. 10. Please state to what extent the Busell cutter was used; and, if there are any exhibits of it before you, specify the same in your answer.

Ans. The cutter marked "Complainants' Exhibit Old Busell Cutter" was used very extensively, and is used at the present time.

Int. 11. Please answer the same question in relation to the Corthell cutter.

Ans. The cutter marked "Defendants' Exhibit Cutter, Corthell patent No. 207,395, Aug. 27, 1878," was used to a limited extent.

Int. 12. Please answer the same question in relation to the Brown and Sharpe cutter.

Ans. The Brown and Sharpe cutter has been extensively used since 1880, and is used extensively at the present time. The exhibits marked "Complainants' Exhibit Busell Cutter, Orcutt pat. of '81," and exhibit marked "Complainants' Exhibit Defendants' Cutters," and exhibits marked "Defendants' Exhibit Stephenson's Cutter No. 2 and No. 3" are substantially Brown and Sharpe cutters.

Int. 13. Please answer the same question in relation to the Orcutt cutter.

Ans. The exhibit marked "Complainants' Exhibit Busell Cutter, Orcutt pat. of '81," has been extensively used, and is at the present time. The exhibit marked "Complainants' Exhibit Orcutt Cutter, first style," I have never seen in use.

Int. 14. Please answer the same question in relation to Stirckler's cutter.

181 Ans. The Stirckler cutter has been extensively used in one large factory, and to a limited extent outside of that. The

cutter now before me, marked "Defendants' Exhibit Stirckler Cutter," correctly represents the cutter.

(Defendants' counsel here puts in evidence the cutter marked as above stated.)

Int. 15. Have you or not trimmed boot and shoe soles with cutters of these various kinds by you described?

Ans. I have.

Int. 16. What was the quality of work done by these several cutters in trimming sole edges?

Ans. The original Coté cutter would not do good trimming until the operators got to grinding chisel edges on the blades; then they did good work. All the others would do first-class trimming.

Int. 17*a*. Please state whether or not the Brown and Sharpe cutters, as made by complainants for sole-edge trimming, have been by complainants provided with an additional rand-cutter: and, if so, please describe the same and present an exhibit thereof, if you have one.

Ans. They have. The Brown & Sharpe Company first made cutters for the Busell Company, under the Brown patent, with a slot across the front face of the cutter, in which the Busell Co. fitted a welt knife for cutting the rand. I here present a cutter such as I refer to.

(Cutter put in evidence by defendants' counsel and marked "Defendants' Exhibit Brown & Sharpe Slotted Cutter.")

Int. 17*b*. What was the degree of utility of this welt knife in the rotary Brown & Sharpe cutter?

Ans. The welt knife in the Brown & Sharpe slotted cutter was of no advantage whatever. Very few pretended to use it. It was furnished separately from the cutter and was recommended by the selling agent and manager of the company as essential, but was discarded by a good many that I knew, and the cutter worked better without it.

Int. 18. Please state whether or not this extra welt or rand cutter, as fitted in the slot of the Brown & Sharpe cutter, is now used by complainants; and, if not, when did they cease making the Brown & Sharpe cutter without the slot?

182 Ans. They may have a few remaining in stock, but are not manufacturing them now. They left out the slot about the time they got the Orcutt patent.

Int. 19. Do you know why they put this extra removable rand or welt cutter in the Brown & Sharpe cutter? And, if so, state your source of information and all you know about it.

Ans. It was placed there to lead the operators to believe that it was an essential improvement on the Brown & Sharpe cutter, which they had patented. In the summer of 1880 I had occasion to order a cutter for Jones & Shippee, Dover St., Boston, and I called on Mr. Noble, the manager of the Busell Co., and requested him to make a Brown & Sharpe cutter without the slot and lip, and with a plain rand guide for the same, for a particular kind of work. He refused

to make what I desired, giving for his reason that he did not wish the operators to get an idea that they could do without the welt knife, as they (the Busell Co.) had a solid patent on that feature of the cutter. I then had one made, such as I desired him to make, at the Morse Twist Drill Co.'s, of New Bedford, which worked very satisfactorily, as well as any cutter I ever used.

Int. 20. Were you present when the exhibits marked "Defendants' Exhibit Milled Iron Bar" and "Defendants' Exhibit Milled Composition Bolt" were milled as they now are?

Ans. I was.

(Defendants' counsel here puts the exhibits referred to and marked as stated in evidence.)

Int. 21. Please state whether the cutters used in milling those exhibits were made specially for that purpose, or whether they were taken at random from among defendants' stock of cutters made for trimming shoe-sole edges.

Ans. They were taken from the stock on hand and from the pins which had the most cutters on and most unlikely to be called for. The stock of cutters is kept in a case having many pins, on which the different styles and sizes are hung by themselves.

Int. 22. Have you trimmed any shoe soles with Defendants' Exhibits Stephenson's Cutters Nos. 2 and 3? And, if so, please produce the same, and state whether they were trimmed before or since using the cutters upon metal, as before stated by you, and how they operated.

Ans. I have with No. 3, after it was used for milling the
183 No. "1" depression in Exhibit "Milled Iron Bar," and No. "1" depression in Exhibit "Milled Composition Bolt." I should not have known, from the operation of the cutter on the edge of the shoe, that it had ever milled iron or metal. It trimmed as well as any perfectly sharp Brown and Sharp cutter. I have here a shoe trimmed with the Stephenson No. 3 cutter, after it had been used to mill the iron and composition, as I have before stated. One side of the sole edge on the shoe has been blacked and "set," and the other is left as the cutter left it.

(The shoe referred to is now put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 7.")

Int. 23. After milling the composition and iron, was the cutter sharpened in any way before trimming the shoe?

Ans. The cutter was not sharpened in any way, shape, or manner, but was used just as it left the metal.

Int. 24. What is your opinion as to the necessity or utility of giving to the Brown & Sharpe trimming cutters a rake or overhang to the front edge or face of the teeth when used for trimming shoe soles? And in answering this question please introduce any exhibits which you have experimented with in reference to the fact involved in this question.

Ans. From experiments I have made and will introduce later I am of the opinion that the rake or overhang of the tooth is not so

essential as the amount of clearance on the top of the teeth and the distance between the cutting edges. I find with a cutter which has its teeth inclining back from its center and a sufficient amount of clearance on the top to form a cutting angle with the front face that it trims as smoothly and leaves the edge in as good condition as when the tooth is raking or overhanging. I now have before me a cutter answering this description with sixteen backward inclining teeth.

(Cutter referred to here put in evidence and marked "Defendants' Exhibit Corthell Cutter No. 1.")

I also have here a shoe-trimmer with this same cutter, one side of which has been blacked and "set" and the other left as the cutter left it.

(The shoe referred to is now put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 8.")

184 I have before me a cutter with twenty-two blades or teeth inclining back from the center, which have a chisel edge substantially the same as "Complainants' Exhibit Coté Cutter (Knights pat)," but has a channel projection and a rand lip and bead, with which I have trimmed the edge of a shoe sole equally as well as with the cutter which I have just before referred to.

(Cutter here put in evidence and marked "Defendants' Exhibit Corthell Cutter No. 2.")

The shoe sole which I trimmed with the last-named cutter I have here, one side of which has been blacked and "set," while the other is as the cutter left it.

(Shoe referred to now put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 9.")

I have before me a cutter with twenty-two overhanging teeth with chisel edges, and substantially the same as the "Complainants' Exhibit Old Busell Cutter." It has a channel cutter, rand lip, and bead. I trimmed a shoe-sole edge with this cutter. I did not detect any particular difference in the work it performed from that of the cutters I have before mentioned; it trimmed very nicely and smoothly.

(Cutter referred to here put in evidence and marked "Defendants' Exhibit Corthell Cutter No. 3.")

I have before me a shoe which I trimmed with the last-mentioned cutter, which shows one side of the sole edge blacked and "set" and the other side as the cutter left it.

(Shoe referred to is now put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 10.")

I have here a shoe which I trimmed with a Bolling cutter, as we used them in C. R. Ford's shop in 1876 and 1877, in Brockton, with which we trimmed edges of a uniform thickness. We made there

all the usual styles of edges, including the square concave edge, the bevel edge, and the imitation cork-sole edge. This shoe which I hold in my hands represents one of the well-known styles, called a "bevelled" edge.

(Shoe referred to put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 11.)

The cutter with which I trimmed the shoe last mentioned is marked "Defendants' Exhibit Thompson Rand and Sole
185 Edge Trimmer." I removed the rand knife and shield which is on the exhibit and substituted in their place the plain rand guard which I now hold in my hand, which caused the cutter to work precisely the same as the Bolling cutter.

(The substituted rand guide referred to is here put in evidence and marked "Defendants' Exhibit Corthell Rand Guide.")

The inner side of the shoe I now have before me shows the sole edge as it comes to the operator, who takes out the rand by hand. The opposite side shows it with the rand removed and the edge ready to be presented to the rotary edge-trimmer—that is, this shoe shows that the necessary hand operation of removing the rand or welt with a hand welt knife preparatory to trimming it with a machine has been performed on the shoe sole on one side of the shoe, while the other side is left as it came from the leveling or beating-out machine.

(The shoe is here put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 12.")

The exhibit boot which I have before me, marked "Defendants' Exhibit Mitchell's Boot," was trimmed with a cutter like the one marked "Complainants' Exhibit Old Busell Cutter" more than six years ago, and it has the well-known style of molded edge called "medium concave square edge." The boot has been subjected to a good deal of rough handling, but still shows an edge of extraordinary finish.

(The boot is here put in evidence and re-marked "Defendants' Exhibit Mitchell Boot.")

Int. 25. Please state how, in your opinion, the quality of the trimming of the soles of the several exhibit shoes named in your last answer will compare with the best trimming done by the Brown and Sharpe cutter, as made and sold by the complainants and by them termed the "Orcutt cutter."

Ans. It is just as good in every respect, and in some cases a great deal better.

Int. 26. Please state whether or not the Exhibit Corthell Shoe No. 11, trimmed with the Bolling cutter, as stated before, has what is known as a "molded" edge or what is termed a "plain" edge.

Ans. It is one of the well-known styles of molded edges called a "beveled" edge.

Int. 27. Please state whether the Bolling cutters used by
186 you in 1876 and 1877, or about that time, would form a molded edge like or similar to Exhibit Corthell Shoe No. 11."

Ans. They would. We made in the shop all the well-known styles of molded edges trimmed with the Bolling cutters and set with a rotary molded iron.

Int. 28. What is your opinion, based upon your experience, in regard to there being any necessary or fixed relation between the diameter of a rotary edge-trimming cutter and the number of teeth in such cutter, and also in relation to the spaces between the teeth?

Ans. I have trimmed with cutters having ten teeth like "Complainants' Exhibit Brown Patent Gear Cutter," and they trimmed with good effect, and I have used cutters like the ones marked "Complainants' Exhibit Old Busell Cutter" and Defendants' Exhibits Corthell Cutters Nos. 2 and 3, of about the same diameter as the Brown gear-cutter and having twenty-two teeth, and which trimmed equally as well as the first-named cutters. I have also trimmed with the Brown & Sharpe cutter made by the complainants, which are of less diameter than the two cutters I have just referred to and having sixteen teeth, which gave about the same results. I have also used cutters like those marked "Defendants' Exhibit Worn Cutters," which are ground away, leaving nearly double the space between the teeth, and they worked equally as well as when new. From my experience in the use of such tools, as stated, I am of the opinion that the only necessary requirements of such tools in regard to the number of teeth in a cutter of proper diameter are, 1st, that there shall be sufficient space between the teeth to admit of their being ground with an emery disc; and, 2d, that the teeth shall not be so few in number that when nearly ground away by repeated sharpening the spaces between them shall be too great to do good work, for the less teeth there are in number, with given spaces between them, the greater distance will each tooth extend along the circle from its front to heel, and consequently the greater will be the distance between the teeth when nearly worn out.

(Adjourned.)

FEBRUARY 25, 1885.

(Direct examination resumed at 2.30 p. m.)

Int. 29. What is your belief, based upon your experience in the use of rotary cutters, in regard to the top or peripheral face
187 of the teeth serving as or constituting a guard or gauge to govern the depth of cut in trimming boot and shoe soles with the Brown & Sharpe cutter, like Complainants' Exhibit "Busell Cutter. (Orcutt pat. of '81)?"

Ans. I do not think, from the experience I have had with the cutter inquired about, that the top or peripheral face of the teeth has anything whatever to do with gaging or governing the depth of the cut, but that the depth of the cut is wholly governed by the exertion of the operator upon the shoe being trimmed in forcing the sole edge against the cutter.

Int. 30. Have you made tests or experiments with special reference to this matter? And, if so, please describe them, making use of any exhibits in that behalf which you may have.

Ans. I have. I have before me two pieces of sole leather nailed together, forming a strip three inches in width before trimming. I presented the edge of the strip to an Orcutt cutter, varying the pressure against the cutter from light to heavy, making a corresponding cut which is shown on this strip of leather as varying from an almost imperceptible cut to one five-eighths of an inch in depth.

(The strip of leather referred to by witness is now put in evidence and marked "Defendants' Exhibit Corthell Experiment, E. H. spec'l ex'r.")

It is the most common and every-day practice where the sole edge, when first secured to the shoe, does not project a uniform distance beyond the upper to bring the sole edge to a uniform projection from the upper by varying the pressure upon the shoe when passing the sole edge along or past the cutter. The perfection of the curved lines of the sole edge when trimmed with the rotary cutter is due solely to the skill of the operator in adjusting or adapting the pressure upon the shoe to the amount that is required to be cut from the edge at every point.

(Adjourned by agreement of counsel to Monday, March 2, 1885, at 10 o'clock a. m.)

MONDAY, *March* 2, 1885.

(Adjourned by agreement of counsel to Tuesday, March 3, 1885, at 10 o'clock a. m.)

188 BOSTON, *March* 3, 1885.

Direct examination resumed by T. W. PORTER, of counsel for defendants:

Int. 31. Please state your opinion as to the relative care and skill necessary in trimming shoes with the Brown and Sharp cutter as made by defendants and complainants and the earlier cutters, such as the "Knights," "old Busell," and "Corthell" cutters.

Ans. It requires a great deal more care and skill with the Brown and Sharpe cutter and the Corthell styles than with any of the former cutters known in rotary trimming-cutters. The Brown and Sharpe cutters are liable, unless special care and pains are taken, to catch and yank the shoe out of the operator's hands; such accidents have often occurred. I have seen shoes so thrown through the shop window, and I never knew such accidents to occur when trimming with the former cutters, such as the "Knights" and "old Busell" or the "Coté."

Int. 32. How do you account for this difference in requisite care and skill in the use of the various cutters inquired about in the last interrogatory?

Ans. I think one of the principal reasons is that the less number of teeth in the Brown & Sharpe cutter and the increase in the distance between the teeth occasioned by grinding and the fact that the

tops of the teeth do not operate to regulate the depth of the cut allows the teeth to take a deep and rank hold of the work when the operator does not exercise the required care. I have noticed that this is liable to occur when the operator has become fatigued or gets nervous or careless from any cause. After such accidents I have known operators to pick up a shoe so thrown and damaged, and then, by the exercise of proper care and skill, to make the edge good with the same cutter. Everything depends, after having the cutter properly sharpened, upon the care and skill with which the operator handles the shoe and presses it with only the proper force against the cutter.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 33. What cutter do you refer to in your fourth answer as "the Corthell?"

Ans. I refer to the cutter in the patent No. 207,395.

189 Cross-int. 34. And by Brown and Sharpe, Orcutt, and Stirckler in that answer you mean cutters which have a rand lip, bed, and guard on the outer end of the teeth, which are sharpened on the flat front face and have their teeth hooking, and in which the molded outer ends of the teeth act like the guard in the hand plane, don't you?

Ans. I do.

Cross-int. 35. When you say channel-cutter in your 9th answer you mean a series of teeth cut on the end of a metal cylinder, as in Exhibit "Thompson Rand and Sole Edge Trimmer," do you not?

Ans. Yes; any cutter that is arranged so as to cut on the bottom of the sole.

Cross-int. 36. Are you not familiar with the Busell patent, No. 188,337, dated March 13, 1877, and is not the channel or guard cutter, called in that patent the "ring-cutter I," substantially the same thing as the channel or guard cutter in the Bolling patent, No. 192,616, and the channel or guard cutter in the Exhibit "Thompson Rand and Sole Edge Trimmer?"

Ans. I am; I should say it was substantially the same.

Cross-int. 37. What has been the increase in rotary trimming and the decrease in hand-plane trimming, in your estimation, since 1880?

Ans. Well, I should say one-half of the edges trimmed now in the boots and shoes that are manufactured are trimmed by rotary cutters. The decrease in making edges by hand plane would be rather more, on account of the draw-cut machine trimmers.

SAMUEL N. CORTHELL.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of John P. Kingsley.

BOSTON, *March* 4, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. John P. Kingsley; age, 50 years; Brockton; machinist.

190 Int. 2. How long have you been engaged in the occupation of machinist?

Ans. Twelve years.

Int. 3. What occupation did you follow before you worked at the machinist trade?

Ans. Shoemaking.

Int. 4. Are you familiar with the use of hand tools like that now shown you, marked "Defendants' Exhibit Snell & Atherton Cutter," in trimming boot and shoe soles? If so, state how long you have been so familiar with them.

Ans. Yes, sir; ever since they were manufactured; I should say thirty years.

Int. 5. Are you familiar, as a machinist, with rotary milling-cutting tools and the use thereof?

Ans. Somewhat familiar with them.

Int. 6. Are you familiar with the rotary cutters that are made by the complainants and defendants in this suit for trimming shoe-sole edges?

Ans. Yes.

Int. 7. Please examine the cutters now shown you, marked "Defendants' Exhibit Corthell Cutter No. 1," "Defendants' Exhibit Corthell Cutter No. 2," "Defendants' Exhibit Corthell Cutter No. 3," and "Defendants' Exhibit Stephenson's Cutter No. 3," and state whether you have seen shoe-sole edges trimmed with them; and, if so, what was the quality of the work which they performed?

Ans. Yes, sir; I considered it an average work for a trimmer; I don't know but it was a little better than an average.

Int. 8. In trimming shoe soles with rotary cutters, such as are made usually by complainants and defendants for that purpose, what is the condition of the superfluous leather which they remove—that is, is it in the shape of shavings or of dust and powder, or what is its condition?

Ans. I should call it dust or powder.

Int. 9. Do these cutters ever, in trimming leather, cut anything in the form of a shaving?

Ans. Not to my knowledge.

Int. 10. Judging from your experience as a machinist, what
191 would be your opinion of the feasibility of milling metals with cutters like the one now shown you, marked "Complainants' Exhibit Defendants' Cutter, S. 80," and similar cutters, such as are made by complainants and defendants for boot and shoe sole trimming?

Ans. I don't see any trouble in using them upon metals if you wanted to.

Int. 11. Please examine the examples of milling now shown you, marked "Defendants' Exhibit Milled Composition Bolt" and "Defendants' Exhibit Milled Iron Bar," and state what, in your opinion, is the quality of the work performed thereon by the milling-cutters.

Ans. I call the work very good, especially the iron.

Int. 12. Have you known of the molding of wood with cutters such as are made by the complainants and defendants for trimming shoe-sole edges; and, if so, what was the character of the work performed by them and the occasion for so using them?

Ans. In fitting irons for the edges we consider the best pattern is made on a piece of wood, giving the best impression. I have known of the use of such cutters for molding wood, so that we can fit an iron for following the cutter. By "iron" I mean either a hand or rotary tool for "setting" the edge after it is trimmed with the cutters.

Int. 13. Please state whether or not it has been the practice since you have been a machinist to make rotary cutters with the front of the teeth varying in their rake or overhang.

Ans. Yes; it has.

Int. 14. Judging from your experience as a shoemaker and from having seen soles trimmed with the exhibit cutters referred to in your 7th answer, in which some have a greater and some a lesser number of teeth, and some have the teeth hooking, and some are inclined back from a radial line, is it or not material, in your opinion, to employ a specified number of teeth or to have the teeth hooking or overhung in order to perform good work?

Ans. I don't see that it makes any material difference.

Int. 15. Do you believe that the best expert in trimming shoe soles with rotary cutters can detect the difference in the quality of the work performed by the different cutters last referred to?

Ans. I don't think they can.

Int. 16. What is your belief, based upon your experience,
192 in regard to governing the depth of the cut when trimming shoe soles with the cutters made by both the complainants and defendants? Is the depth of cut governed by the form of the teeth or is it governed by the pressure exerted by the operator upon the shoe?

Ans. By the operator.

Int. 17. What is the object, if any, in leaving the blank or triangular piece of metal which is front of the four teeth in "Defendants' Exhibit Snell & Atherton Cutter," and does it practically, in your opinion, perform any office whatever when the tool is used in trimming the edges of shoe soles?

Ans. It makes it stronger, and it will be easier to use it; but it can be used without it.

Int. 18. Please examine the boot now shown you and marked "Defendants' Exhibit Mitchell Boot" and state whether or not the

edge of the sole exhibits one of the well-known styles of molded edges.

Ans. That is a common style.

(Adjourned to March 5, 1885, at 10 a. m.)

BOSTON, *March* 5, 1885.

Direct examination resumed:

Int. 19. What, in your opinion, has been the increase, if any, in trimming boot and shoe soles with rotary trimmers since 1880?

Ans. I should think there had been nearly one-half.

Int. 20. What has been the change in the use of hand trimming tools during that time? Has it increased or decreased, and in what proportion?

Ans. It has decreased, I should think, from a third to a half.

Int. 21. Please state, as nearly as you can, the number of hand tools made weekly at the factory where you are employed, including those made entirely new and those having the cutters applied to them.

Ans. I should think about fifteen dozen.

Int. 22. When a new cutter is applied to a hand tool does it or not possess the same wearing and enduring capacity as an entire new cutter?

Ans. Just the same.

Int. 23. By the hand tools spoken of in your preceding
193 answer do you or not refer to cutters like "Complainants' Exhibit Hand Plane" now shown to you?

Ans. Yes, sir; that is it.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 24. Please refer to your 19th question and answer and explain the answer more fully.

Ans. I mean twice as many trimmed now as there were then.

JOHN P. KINGSLEY.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Herbert Gough.

BOSTON, *March* 4, 1885.

Direct examination by T. W. PORTER, Esq., of counsel of defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Herbert Gough; age, 28 years; Boston; machinist.

Int. 2. How long have you been engaged in the occupation of machinist and at what places have you worked?

Ans. Twelve years. I worked in the Boston Machine Company's, for D. Whittemore, and Hinkley Locomative Works, for Eddy, Walker & Co., and for F. Bean.

Int. 2. Have you, during your employment as machinist, manufactured or used milling-cutters or tools; and, if so, at what places?

Ans. I have; at Hinkley Locomotive Works, for Eddy, Walker & Co., and for Mr. Bean.

Int. 4. Please state when you were employed at the factory of D. Whittemore, stating as nearly as you can when you went to work there and when you quit work there.

Ans. About from the middle of January, 1878, till about the middle of May, 1879.

Int. 5. Was F. M. Stevens, one of the defendants in this suit, working at Whittemore's factory at the time you was employed there?

Ans. He was.

194 Int. 6. Are you familiar with the cutters like or similar to those now shown to you and marked "Complainants' Exhibit Busell Cutter (Orcutt patent of '81)," and like or similar to that shown in the Orcutt patent, No. 238,303, now shown you?

Ans. Yes; I am.

Int. 7. Did you or not see F. M. Stevens working on or constructing any cutters like or similar to these while you were working at Whittemore's factory, as stated by you? If you did please state, as clearly as you can, all you know in relation thereto.

Ans. I did. Stevens was working for Noble, doing experimenting and building work for him and building these cutters. He built two, as I know of, and Noble took them off to try them, and I asked Frank where they had gone and he said Noble had taken them, and that's the last I saw of them.

Int. 8. What was the date or about the date, as near as you can remember, when Stevens completed those two cutters?

Ans. I would say the first week in September or the latter part of August, 1878.

Int. 9. Please state your means of fixing the date when you went to work for Whittemore, as stated.

Ans. I fix it by the fact that I came home from South America in December, 1877, and I went down to Whittemore's and got the promise of a job from Mr. Leavitt. He said he would send for me if he had anything, which he did in the course of about six weeks.

Int. 10. Please state how you fix the date when Stevens completed those two cutters, as you have stated.

Ans. I had a friend, a marine engineer, come in to see me and I wanted to show them to him, but Leavitt ordered him out, and so it was impressed on me from that circumstance, and that was early in September, 1878.

Int. 11. How often should you say Mr. Noble was in there to see Stevens when he was making these cutters, as you have stated? State as near as you can.

Ans. As near as I can remember, he was back and forth nearly all the time.

195 Int. 12. Please state whether these cutters made by Stevens for Noble, as you have stated, had the teeth formed upon the hub or whether the teeth were inserted in the hub.

Ans. Inserted in the hub.

HERBERT GOUGH.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Joseph H. Miles.

BOSTON, *March* 5, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Joseph H. Miles; 50 years; Brockton; edge-trimmer, operating edge-trimming machines.

Int. 2. How long have you been engaged in the occupation of trimming the edges of shoe soles?

Ans. I trimmed for twenty years by hand. I begun on the machines six years last July?

Int. 3. How many different kinds of rotary cutters have you used in trimming shoe soles?

Ans. I have trimmed with the Coté, Busell, and Stevens, of the different styles in which they have been made.

Int. 4. Did you trim the boot now shown you, marked "Defendants' Exhibit Mitchell Boot;" and, if so, with what kind of a cutter and when?

Ans. I did, with the old-style Busell cutter, in August, 1879.

Int. 5. Please state what is the quality of edge on this boot, in so far as the operation of the cutter was concerned, and whether it is a plain or molded edge.

Ans. I should call it first quality and a molded edge.

Int. 6. Have you seen shoe soles trimmed with the cutters now shown you and marked "Defendants' Exhibit Corthell Cutter No. 1," "Defendants' Exhibit Corthell Cutter No. 2," "Defendants' Exhibit Corthell Cutter No. 3," and "Defendants' Exhibit Stephenson's Cutter No. 3?"

196 Ans. I have.

Int. 7. Which one of these cutters, in your opinion, is the better cutter and performs its work in the better manner?

Ans. I think the Exhibits Corthell Cutter Nos. 2 and 3 are the best and not much difference between them.

Int. 8. Do you believe that there is any material advantage in having the front face of the teeth in cutters like those now shown you, marked "Complainants' Exhibit Busell Cutter (Orcutt patent of '81)," overhung or hooking? And please give the reasons for your opinion.

Ans. I do not. The reason for my opinion is that there is hardly two operators that grind those cutters on the same pitch; for me, I grind them a little back, because I think they work better. They cut smoother and are not so apt to catch.

Int. 9. How is the front face of the cutters made and sold by the Busell Trimmer Co.—that is, the cutting portion of it? Is it hook-

ing to any extent or not, and how are the exhibit cutters just referred to in that respect?

Ans. I should think they are about straight up and down; they would be after grinding once.

Int. 10. Please examine the cutters now shown you, marked "Defendants' Exhibit Worn Cutters," and state whether they have teeth, as they were last ground, that are hooking or otherwise.

Ans. I should say one of them is hooking and the other two about straight. The one marked "No. 11, S T T B," is hooking; the one marked "No. 5, P F B," is not hooking in the bed, but is hooking in the channel; the one marked "No. 12, M C," is nearly straight, but, if anything, a little back.

Int. 11. Have you ever seen an operator of rotary cutters who made it a practice to grind this kind of cutters so as to have the teeth hooking?

Ans. I have never seen an operator do it, unless when the cutter was almost worn out he would grind it hooking to get more use out of it and to prevent grinding away the outline of the bed.

Int. 12. Which kind, of all the rotary trimmers you have used, is the most difficult to the operator and most liable to take work out of his hands?

197 Ans. Those with a lip running on the bottom of the sole, such as those marked "Complainants' Exhibit Busell Cutter (Orcutt patent of '81)."

Int. 13. Please state what results you have seen from the difficulties referred to in the preceding question.

Ans. In the shop that I work in the result has been for the past month two pairs a week that would have to be ripped to pieces and new soles put on, because they were spoiled by the catching of these cutters.

Int. 14. Please state whether experience and usual care is a sure preventative of these accidents.

Ans. I don't think it is. Furthermore, I never saw an operator who could tell why the work was taken out of his hands.

Int. 15. What is your opinion, based upon your experience in trimming, as to whether or not the top of the teeth in these cutters serves as a guard to gauge the depth of cut?

Ans. In my experience, I think there is no guard to the depth of cut.

Int. 16. How does the operator govern the depth of cut, and can he or not vary it at will as he pleases?

Ans. By the pressure of the sole on the cutter. If he could not vary it he could not operate it — all.

Int. 17. Is there any class of good quality of work that can be trimmed on the bed and have the entire rand taken out with these cutters at one and the same operation?

Ans. No, sir; there is not. I don't consider that the cutter takes out any rand at all.

Int. 18. Please examine the shoe now shown you, marked "Defendants' Exhibit Corthell Shoe No. 12," and state whether the right-hand side of the fore part of the sole fairly exhibits the usual method

of cutting out the rand by hand before the sole is trimmed by these cutters.

A. Yes, sir.

Int. 19. Please examine the shoes now shown you and marked respectively "Defendants' Exhibit Corthell Shoes Nos. 7, 8, 9, 10, 11," and state what, in your opinion, is the quality of the trimming of the sole edges thereof.

198 Ans. I should state that it is good quality.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 20. In July, 1878, what kind of a trimmer did you use?

Ans. The Busell trimmer with a cutter like Exhibit Old Busell Cutter.

Cross-int. 21. And there was a rand knife which rotated with that cutter, wasn't there?

A. Yes, sir.

Cross-int. 22. Please explain what you mean by Coté, Busell, and Stevens cutters in your 3d answer.

Ans. There is the Coté (referring to "Complainants' Exhibit Coté Cutter, Knights' pat."). That (referring to "Complainants' Exhibit Busell Cutter") is the new-style cutter, and that (referring to Defendants' Exhibit Stephenson Cutter No. 3") is the Stephens.

Cross-int. 23. Do you see any substantial difference between these three cutters, Exhibits Stephenson's Cutter No. 3 and Busell Cutter (Orcutt patent of '81)?

Ans. I don't see any difference.

JOSEPH H. MILES.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Charles E. Moore.

BOSTON, *March* 10, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Charles E. Moore; 52 years; Boston; machinist.

Int. 2. How long have you been engaged in business as a machinist and what varieties of work have you manufactured?

Ans. Been engaged in business for myself twenty-five years; have manufactured new machinery of different kinds and done jobbing of all kinds.

199 Int. 3. Have you heretofore testified as an expert in patent cases? And, if so, state in what cases you have testified.

Ans. Yes; I have. In the paper-collar machinery cases and in some leather-splitting machinery cases and in paper-machinery cases.

Int. 4. Have you examined letters patent of the United States

numbered 238,303, dated March 1, 1881, and letters patent of the United States, dated March 4, 1879, numbered 212,971; and, if so, do you understand the same?

Ans. I have examined them and understand them.

Int. 5. Please state whether or not you discover any substantial difference between the cutters shown in these two patents, except in the fact that in the earlier patent the teeth and hub are formed of an entire piece, while in the later patent the teeth are formed separately and inserted in the hub?

Ans. That is the only difference that I can see.

Int. 6. Are you familiar with the class of cutters known as the Brown or Brown & Sharpe cutters, like or similar to that now shown you, marked "Defendants' Exhibit Brown Gear Cutter No. 2, E. H., spec'l exam'r; if so, how long have you known them?

Ans. Yes; I am familiar with them; have used them some ten or twelve years; think I have used them as long as they have been on the market.

(Cutter referred to now put in evidence by defendants' counsel.)

Int. 7. Please examine the cutters now shown you, marked "Defendants' Exhibit Mitchell Cutter" and "Defendants' Exhibit Stephenson's Cutter No. 3," and state whether, in your opinion, they are adapted to or are capable of milling metal and whether they possess any features which would prevent their milling metal in a practical manner.

Ans. They are capable of milling metal and do not possess any features which would prevent their milling metal in a practical manner.

Int. 8. Assuming that hand tools for trimming sole edges like those now shown you, marked "Defendants' Exhibit Snell and Atherton Cutter," "Snell & Atherton Cutter No. 2," "Complainants' Exhibit Hand Plane," "Defendants' Exhibit Dunham Edge
200 Cutter," and "Defendants' Exhibit Hazard's Improved Dunham Edge Cutter," were old, common, and well known; that it was common and well known to trim shoe-sole edges with rotary cutters having a rand lip like those now shown you, marked "Defendants' Exhibit Rand and Edge Cutter," "Complainants' Exhibit Coté Cutter (Knights' patent)," "Complainants' Exhibit Old Busell Cutter," and "Defendants' Exhibit Thompson Rand and Sole Edge Trimmer," and also that the "Brown gear-cutter No. 2" was old and well known, would it or not, in your opinion, constitute an invention to produce a cutter like those now shown you, marked "Complainants' Exhibit Busell Cutter (Orcutt patent of '81)?" And please state your reasons for the opinion which you may give.

Ans. It would not require invention as far as the shape and cutting edge is concerned; but if the clearance of the cutting edge is produced by the edge being thrown back and leaving the cutting edge slightly further from the center of the cutter than the back of the tooth, as the appearance of these exhibits seems to indicate, that particular part of the cutter I should consider required an inven-

tion; but considered simply as a rotary cutter for performing the same work as the preceding exhibits it is not an invention.

Int. 9. If it was common to produce the clearance in the teeth in cutters like that shown you, marked "Defendants' Exhibit Snell & Atherton Cutter," by bending them back, would there, in your opinion, be any novelty or invention in producing clearance in the same way in the teeth of rotary cutters?

Ans. There would not.

Int. 10. Do you regard it as in any respect a novel or peculiar feature to make cutters like those marked "Complainants' Exhibit Busell Cutter (Orcutt patent of '81)," with the front flat face of the tooth overhung so as to make the tooth somewhat hooking?

Ans. No; I do not.

Int. 11. Please state whether or not the upper portion of the front face of the teeth of these cutters is overhung to any material extent or what is its relation to a radial line.

Ans. Well, as near as I can see they are practically on a radial line.

Int. 12. What, in your opinion, would be the feasibility of molding wood with these cutters if such form was desired?

201 Ans. I think they would do the work very nicely.

Int. 13. What would be your opinion of the correctness or incorrectness of the statement, if made to you, that it was a peculiar and novel feature in a rotary cutter, embodying the essential features of the Brown patent, to form thereon a thin ridge shown at one side or end in the cutters marked "Complainants' Exhibit Busell Cutter (Orcutt patent of '81)" and as marked with the numeral "1" in the Orcutt patent, No. 238,303?

Ans. That it was incorrect.

Int. 14. Please state your reasons for the opinion last given.

Ans. I can see nothing in these cutters except that they are ordinary molding-cutters. The cutting edge of the cutters, being of such shape as required, makes it necessary that this ridge marked "1" on the patent cut should be a part of the cutter in order to give it the desired shape.

Int. 15. Please examine the exhibits now shown you, marked "Defendants' Exhibit Milled Composition Bolt" and "Defendants' Exhibit Milled Iron Bar," and state what, in your opinion, is the quality of the work performed in milling the channels in each marked 1 and 2.

Ans. Very good, indeed.

Int. 16. Please state whether or not, in your opinion, it would be a practical way to sharpen the cutter now shown to you, re-marked "Defendants' Exhibit Colt's Armory Cutter No. 3," by grinding the flat front face of the teeth with an emery disc like "Defendants' Exhibit Emery Disc," but of less diameter.

Ans. Quite practical.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 17. The latter part of your answer to interrogatory 8

does not seem to be entirely clear. Will you please explain more fully what you mean by it?

Ans. I mean that not considering the manner in which the cutter was made there is nothing about them different from any ordinary molding or rotary cutter.

(Adjourned.)

202 BOSTON, *March* 11, 1885.

(Cross-examination resumed:)

Cross-int. 18. What do you understand to be the purpose of the ridge marked "1" in the Orcutt patent, No. 238,303, and referred to in your answer to interrogatory 14?

Ans. I understand that it is for the purpose of cutting or forming the edge of the sole of the boot or shoe; and I should consider that it was intended for cutting the leather, making a bevel edge on the sole.

Redirect:

Int. 19. Please state whether or not it is a well-known practice with mechanics to form rotary cutters in sections or separate toothed discs instead of forming them in one entire piece.

Ans. It is.

Int. 20. How long has that practice been followed, to your knowledge?

Ans. I have known it a great many years. I don't know how long.

Int. 21. Supposing it were common to trim or cut the bevel edge of the sole, as you have termed it in answer to cross-int. 18, with cutters having a thin ridge like that shown at one side in "Defendants' Exhibits Snell & Atherton Cutter" and "Snell and Atherton Cutter No. 2," and with a sharp-ended cutting bar in connection with a rotary cutter, as shown in "Defendants' Exhibit Rounds' Rand and Edge Cutter," would there, in your opinion, be anything novel in making a cutter like that shown in complainants' patent, No. 238,303, with a thin ridge like that marked "1" for the same purpose?

Ans. There would not.

Int. 22. Please state whether or not there would, in your opinion, be required any special skill over that of ordinary mechanics in working wood and metal to produce cutting tools, whether rotary or otherwise, for cutting leather.

Ans. There would not.

Int. 23. Is it or not a material which may be cut either by a rotary tool or by a tool held in the hand with as little difficulty as almost any material that enters into the mechanic arts?

Ans. I think it is.

C. E. MOORE.

Attest: EUGENE HUMPHREY,
Special Examiner.

203 *Deposition of Andrew Eppler, Jr.*

BOSTON, *March* 12, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Andrew Eppler, Jr.; 44 years; Boston; machinist.

Int. 2. Have you had experience in the matter of shoe machinery, and particularly in relation to rotary cutters for trimming the sole edges of shoes? And, if so, state how long you have had such experience and the extent thereof as well as you can.

Ans. I have had fourteen years' experience in shoe machinery, and the first cutter that I saw for trimming the edges of boot and shoe soles was in the year 1875. That was gotten up by Charles Goodyear. That had a guard shield, and was to make a round edge. I was superintendent of the Goodyear & McKay Sewing Machine Company, and have been in the shoe shops looking at the working of those machines as well of machines for trimming edges; have also tried to make cutters for those machines. In 1883 I furnished Albert E. Stirkler with money to develop a cutter, which was a success. I sold out my interest to an agent for Tilton, of Ashland. Since then I have paid no attention to cutters.

Int. 3. Are you familiar also with the various kinds of milling-cutters employed for milling metals? If so, please state how long and the extent of your experience.

Ans. I have used milling-cutters for twenty-three years on sewing-machines and gun work and building Stevens' patent vises and brass work of various descriptions.

Int. 4. What is your opinion as to the questions whether it would be practical to mill metals with rotary cutters like or similar to those now shown you, marked "Complainants' Exhibit Defendants' Cutter" and "Defendants' Exhibit Stephenson Cutter No. 2" and "No. 3" and "Defendants' Exhibit Corthell Cutter No. 1?" And in giving your answer please refer to any exhibits you have used or prepared in relation to this question.

Ans. I should consider the cutters marked Complainants'
204 Exhibit Defendants' Cutter practical to mill either iron, steel, or brass, as well as leather. Defendants' Exhibit Corthell Cutter No. 1 is equally suitable for milling metals or leather. Defendants' Exhibit Stephenson Cutter No. 2 is also practical for milling metals and leather. This has a drawing cut, and we frequently have cutters made in that way for milling iron and brass. Exhibit Stephenson's Cutter No. 3 is substantially the same as No. 2. The cutter I hold in my hand I have used on milling a fine piece of cast iron, which I now produce, having given this as severe a test as I should give any cutter, running it at about ninety revolutions on a Brown & Sharpe milling machine, feeding automatically with the fine feed, which I should use for producing work of like character. I will further say that this slot was made with one cut.

(The cutter last referred to and the milled iron here put in evidence by defendants' counsel and marked respectively "Defendants' Exhibit Eppler Cutter, E. H., spec'l exam'r," and "Defendants' Exhibit Eppler Milled Bar, E. H., spec'l exam'r.")

Int. 5. Please state whether or not the rotary speed of the cutter and the feeding movement of the bar being milled, as stated in your last answer, were the usual speeds given to the cutter and the article being milled when using other kinds of cutter that are usually employed in machine shops.

Ans. It was the usual speed for that size of cutter, and the feed was as fast as would produce work without a waving surface, both being the same as I should give in using other kinds of cutters for producing similar work.

Int. 6. What, in your opinion, would be the feasibility of milling with the cutter marked "Defendants' Exhibit Eppler Cutter" all the various metals that are milled in machine shops? And in answering this please refer to the matter of speed with which it might be driven and the feed motion of the material being milled.

Ans. With the proper speed generally used on a cutter of this diameter it will give as good satisfaction, with a proper feed of the work and skill of the mechanic, as any cutter used to-day in machine shops.

Int. 7. What is your opinion, based upon your experience, as regards the thin ridge at one side or end face of the several
205 cutters to which your attention has been called and which is shown and marked "1" in the Exhibit Orcutt Patent of 1881—that is, is it or not unusually high according to its thickness of base, and have you or not seen other cutters having ridges or teeth formed to cut groves as deep and narrow as this would cut?

Ans. I do not think it unusually high. I have seen cutters having ridges or teeth formed to cut deeper than this—deeper in proportion to their thickness. I have seen these in practical operation in the factory of D. Whittemore, at Wollaston, for the purpose of cutting a groove for the knife in a Varney peg-box.

Int. 8. What is the practical height of the thin lip on any of these cutters above the point where it would break, if it was subjected to sufficient strain to break the lip? In other words, would the breaking point be above or below the top of the small ridge or bead?

Ans. I should say in practice the majority of the breaks would be above the top of the ridge. The highest lip of these cutters is one-sixteenth of an inch; the lowest, one thirty-second of an inch.

Int. 9. Have you or not, during your experience in shoe machinery, familiarized yourself with the practical operation of rotary cutters when used in trimming shoe soles?

Ans. I have never held a shoe up to a cutter, but I have trimmed strips of leather, and have devoted a great many hours to seeing machines in practical operation, in the hands of operators, for the purpose of improving the machines and cutters.

Int. 10. Are you familiar with the cutters made and sold by the

Busell Company, the complainants in this suit, and with those made and sold by F. M. Stevens & Co., the defendants in this suit; and, if so, how is the backing off or clearance upon the top of the molded teeth produced by each in their cutters.

Ans. I am. The Busell cutter has its clearance produced by bending back the teeth eccentric to the center. The Stevens cutter has its clearance produced by the well-known method of the eccentric former or cam shape, which, in my opinion, is the most mechanical way of producing clearance on a cutter—that is, the cutter being first molded as a circle, then spaces cut to form the teeth, and then the top of the teeth are cut eccentric by the use of a molding tool worked by a cam, as stated.

206 Int. 11. In your opinion, does or not the peripheral or molded face of the teeth of these cutters act or serve as a guard when trimming shoe-sole edges by holding a shoe in the hand and pressing the same against the cutter? And please state your reasons for the opinion you may give.

Ans. They do not. As the cutter is ground away it shows less and less width of tooth at every operation of grinding, and it is a well-known fact that they have been ground, in hundreds of instances, so that the face of the tooth is not thicker than one sixty-fourth of an inch, which will show that as there is no guard left, if there ever was one, it depends upon the manipulation by the operator, as the speed of the machine or cutter, as I understand, is seven or eight thousand revolutions per minute. There being sixteen teeth in each cutter, it will be seen that about two thousand blades will strike the edge per second, and to prove there is no guard a piece of leather can be severed in twain by continuing the cutting through the center of it. As I understand, a guard is something to guide the work, so that it cannot be injured by an unskilled workman.

Int. 12. What is the angle of the front flat face of the teeth of these cutters as they are ground by workmen when in practical use, so far as you have observed?

Ans. The angle will vary, and the variations will be as numerous as the different operators who grind the cutters, some being ground ahead of the center and some back of the center.

Int. 13. How is the cutter marked No. 12, M. C., in figures and letters, on the hub, and by tag "Defendants' Exhibit Worn Cutters," ground on the front of the teeth? Are they ahead of the center or back of the center?

Ans. They are about a sixteenth of an inch ahead of the center, which is the reverse of being hooking.

Int. 14. Please examine the cutters shown you, marked Complainants' Exhibit Busell Cutter (Orcutt Patent of '81)," and state whether the rake of the front of the teeth is alike in the two cutters—that is, whether the teeth are hooking to the same extent in the two cutters.

Ans. They are not exactly alike.

207 Int. 14*a*. You will observe on the front face of the teeth in these cutters two angles, an upper and shorter one, which is

nearer a radial line, and a lower and longer one, which is more oblique to a radial line, and which undercuts the upper and shorter angle. What is the object or benefit of the longer and undercutting angle or face of the teeth?

Ans. The object is to facilitate the grinding of the face of the tooth or cutting edge, thereby showing less surface to be ground by the emery wheel.

Int. 15. Taking the cutters of this kind which you have seen in use by trimming operators, how would the front face of the tooth as they ground it compare with that shown in the exhibit cutters in question? Would the upper front face be more or less hooking than these under consideration?

Ans. I should say in nine cases out of ten the operator would grind it so that it would be less hooking than the cutters inquired about.

Int. 16. Please examine the cutters now shown you, marked "Defendants' Exhibit Corthell Cutter No. 1" and "Corthell Cutter No. 2," and state whether or not the teeth are hooking or the reverse, and your opinion as to their adaptability to trimming shoe soles?

Ans. I find that they are a sixteenth of an inch the reverse of being hooking. There is no doubt of their practicability for the purpose of trimming shoe soles. I think they will do the work equally as well as any cutter exhibited to-day.

Int. 17. What difference, if any, do you discover in the matter of the guard upon the outer or end face of the teeth, if such a thing were possible, between the cutter now shown you and marked "Complainants' Exhibit Old Busell Cutter" and the cutter marked "Defendants' Exhibit Corthell Cutter No. 2," and "Defendants' Exhibit Corthell Cutter No. 3" and "Defendants' Exhibit Rounds' Rand and Edge Cutter," "Defendants' Exhibit Worn Cutters" and the cutters marked "Complainants' Exhibit Coté Cutter (Knight's patent)," except that there is more or less extent of peripheral face upon the teeth of these various exhibits?

Ans. None whatever; as I claim, there is no guard.

Int. 18. How do the teeth in these various cutters remove the surplus leather from the edge of the sole when they are trim-
208 ming the same—that is, speaking as a mechanic, how do they act upon the sole? Do they shave off the leather? Do they beat it off by their violent contract with it, or how do they remove it, and what is the shape or condition of the surplus leather when removed by the cutters? Please describe it just as you would to another mechanic.

Ans. By the rapid contact of the teeth with the leather they scrape it off. It resembles a mixture of fine dust and sawdust.

(Adjourned. Examination of this witness to be resumed Monday, March 16, 1885, at 10 o'clock a. m.)

BOSTON, *March* 16, 1885.

Direct examination resumed:

Int. 19. Please state whether you know of any reason except con-

venience of grinding, as stated by you in a former answer, why the narrow, oblique slot in complainants' cutters, such as those marked "Complainants' Exhibit Busell Cutter (Orcutt patent of '81,") is carried a considerable distance below that portion of the other angle of the front face which is next the cutting edge?

Ans. For the purpose of bending back the teeth so as to get the clearance for the cutting edge. The cuts coming nearer to the center, making the stock between the cuts narrower, allow the operation of bending to be formed more readily.

Int. 20. What has been the practice, so far as your experience has extended, in regard to forming the front face of the teeth of milling-cutters, either with or without rake?

Ans. That is notional with the different mechanics, one claiming that a hooking or raking cut will make smoother work than if slanting the other way, and others claiming that a scraping cut will make the smoothest work.

Int. 21. What has been the practice of the manufacturers—that is, Brown & Sharpe—in the manufacture of the cutter known as the "Brown" or "Brown & Sharpe" patent cutter. Have they been made with the teeth hooking or the reverse, and have they been uniform or various in that respect? In answering this question please refer to Defendants' Exhibit "Brown Gear Cutter No. 2," Complainants' Exhibits "Milling Cutter," "Brown Patent Gear Cutter," "Brown and Sharpe Milling Cutter No. 1," and "Brown and Sharpe Milling Cutter No. 2."

209 Ans. The gear cutters are generally on a radial line; all that I ever saw were that way. The "milling-cutter" is a little forward of the center—that is, a little reverse of hooking. The "Brown & Sharpe Milling Cutter No. 1" I find is five thirty-seconds ahead of the center or reverse from hooking. The "Brown & Sharpe Milling Cutter No. 2" I find nearly on a radial line. The "Brown Patent Gear Cutter" is the same as the "milling-cutter" that I have spoken of.

Int. 22. Suppose it was old and common to trim sole edges with rotary cutters like those now shown you marked "Complainants' Exhibit Old Busell Cutter," "Complainants' Exhibit Coté Cutter (Knight's patent)," "Defendants' Exhibit Rounds' Rand and Edge Cutter," and "Defendants' Exhibit Cutter, Corthell Patent No. 207,395, August 27, 1878; that it was also old and common to trim sole edges with hand tools like "Defendants' Exhibit Snell & Atherton Cutter" and "Snell & Atherton Cutter No. 2," and that it was common to make cutters with a molded upper or outer face of the teeth and having a flat front face for grinding like "Defendants' Exhibit Brown Gear Cutter No. 2" and "Complainants' Exhibit Brown Patent Gear Cutter," would there, in your opinion, be any invention in producing a cutter like "Complainants' Exhibit Busell Cutter (Orcutt patent of '81)?"

Ans. No; I do not see anything new or novel, excepting the bending back of the teeth for the purpose of clearance, as any mechanic could make a cutter to any desired shape of the boot edge from either of the old cutters exhibited to me.

Int. 23. Supposing it had been old and well known before the date of Orcutt's alleged invention to bend back the teeth in trimming tools like "Defendants' Exhibit Snell & Atherton Cutter" to produce clearance, would there, in your opinion, be anything new or novel in producing clearance in cutters like those marked "Complainants' Exhibit Busell Cutter (Orcutt pat. of '81)" by bending back the teeth?

Ans. No; there would not.

Int. 24. Why, in your opinion, is there a bevel at the teeth on the rand-lip side of the cutter marked "Defendants' Exhibit Snell & Atherton Cutter?"

Ans. The blanks being got out in quantities, it is necessary to grade them as to thickness, according to the thickness of the
210 sole edge on which they are used. After molding the cutter if there is left a surplus stock on the rand-lip side it is removed by bevelling the tool on that side. The same thing, practically, is shown in the manufacture of the rotary cutters, as is shown by comparison of "Defendants' Exhibit Eppler Cutter" with "Complainants' Exhibit Defendants' Cutter." The blanks are made of a uniform thickness of three-quarters of an inch and the extent to which the sleeve-like hub extends from the guard side of the cutter is determined by the thickness of sole which the cutter is formed to trim.

Int. 25. Is there, in your opinion, anything unusual or anything requiring more than ordinary skill in forming the rand-cutting lip at one side of sole-trimming cutters with a sufficiently sharp top to enter between the sole and upper?

Ans. No; as it is easier to turn up a straight face than to have a beveled face. The rand lip or ridge is not unusually thin considering the work it has to do, which is demonstrated in the "Defendants' Exhibit Worn Cutters," where the rand lip is almost worn away and yet is sufficiently strong for the work it does.

ANDREW EPPLER, JR.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Jacob P. Thompson.

Present: J. E. Maynadier, of counsel for complainants; T. W. Porter, Esq., of counsel for defendants.

BOSTON, *April* 1, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Jacob P. Thompson; 44; Brockton; shoemaker.

Int. 2. How long have you worked at the business of shoemaking?

Ans. Thirty years.

Int. 3. Are you familiar with that branch of the business which relates to the finishing of boot and shoe edges?

Ans. Yes, sir.

211 Int. 4. Please examine the things now shown you and respectively marked Def'ts' Exhibit Dunham Edge Cutter, Compl'nts' Exhibit Hand Plane, Def'ts' Exhibit Hazard's Improved Dunham Edge Cutter, Compl'nts' Exhibit Coté Cutter, Knights' patent; Compl'nts' Exhibit Rounds' Rand and Edge Cutter, Compl'nts' Exhibit Old Busell Cutter, Def'ts' Exhibit Thompson's Rand & Sole Edge Trimmer, and Def'ts' Exhibit Cutter, Corthell pat. No. 207,395, Aug. 27, 1878, and state whether or not you are familiar with and have used a part or all of them in the business of trimming sole edges.

Ans. I have used the whole of those.

Int. 5. Have you used and are you familiar with the use of cutters like those now shown you, marked Compl'nts' Exhibit Busell Cutters, Orcutt pat. of '81?

Ans. Yes, sir.

Int. 6. Is it practical in trimming shoe soles with cutters like those last named to take out the rand with the rotary cutter only?

Ans. No, sir.

Int. 7. What rotary cutter, if any, have you ever seen or used that will take out the rand at the same time that you trim the edge of the sole?

Ans. The old Busell cutter comes the nearest to it.

Int. 8. How was the rand-cutter arranged in the old Busell cutter, and how different, if in any respect, from the rand-cutter, so called, in the Orcutt patent?

Ans. This old Busell cutter was on a hollow shaft, and there was a spindle went through it and the rand knife was attached to that spindle. It was not stationary; it would yield according to the thickness of the rand. The rand-cutter moved sideways, independent of the rest of the cutter.

Int. 9. Please examine the catalogue now shown you and state whether or not the parts represented and marked as follows in said catalogue—112, on page 26; 113, 114, 116, and 117, page 27; 118 and 119, on page 28; 122, 132, and 133, on page 29, were employed in the old Busell cutter as used by you.

Ans. Yes, sir.

(The catalogue referred to is now put in evidence and marked Defendants' Exhibit Complainants' Catalogue, W. A. C., sp'l ex'r.)

212 Int. 10. What was the quality of the work performed and the convenience to the operator in using cutters like Compl'nts' Exhibit Coté Cutter, Knights' patent, as compared with the Orcutt cutter?

Ans. Well, about all the difference is the Orcutt cutter there cuts a bead.

Int. 11. How was it customary to sharpen the Coté cutter, just inquired about, upon the top edge or the front edge of the teeth?

Ans. I used to sharpen mine on the front edge and on top.

Int. 12. In using the Orcutt cutter, what is the practice with operators, so far as you have observed, in the matter of grinding or

forming the front flat face of the teeth? Do they have them hooking or the reverse or on a radial line?

Ans. On a radial line.

Int. 13. Please examine the cutters marked Defendants' Exhibit Worn Cutters, and state whether the two marked upon the hub, No. 5 and No. 11, are or not worn away more than is usual in the use of such cutters.

Ans. No, sir.

Int. 14. How would cutters worn away as much as those are work compared with new cutters like Compl'nts' Exhibit Busell Cutters (Orcutt pat. of '81)?

Ans. I think the one marked No. 11 works better than a new one. I think the No. 5 makes a finer edge than a new cutter will make.

Int. 15. Please state whether, in your opinion, the so-called Orcutt cutter can take out the rand to any greater extent when trimming the sole edge than it can be taken out with Exhibit Hand Tools, about which you have testified.

Ans. No, sir.

Int. 16. Please state whether you have used in trimming sole edges the three cutters respectively marked as follows: Def'ts' Exhibit Corthell Cutter No. 1, Def'ts' Exhibit Corthell Cutter No. 2, and Def'ts' Exhibit Corthell Cutter No. 3; and, if so, state which of the three is the better cutter—that is, which will perform the best work; also which is the second best, if there is any second best, and which is the poorest.

Ans. I have. No. 2 I have done the best job with, and No. 1 the next. No. 3 I call the poorest.

213 Int. 17. Judging from your experience in the use of cutters, do you believe there is any advantage in having the teeth hooking for sole-edge trimming?

Ans. No, sir.

Int. 18. Have you done any trimming or made any experiments in trimming with Def'ts' Exhibit Colt's Armory Cutter No. 4; and, if so, how did they operate for trimming the edges of soles? And if you see any work done with them please indicate the same.

Ans. Yes, sir; here is an edge that I trimmed with that cutter. They operated very good.

(The shoe produced is put in evidence and marked Defendants' Exhibit Thompson Shoe, W. A. C., sp'l ex'r.)

Int. 19. Please state whether or not this sole edge as trimmed with the Exhibit Colt's Armory Cutter No. 4 is a well-known form of sole edge.

Ans. Yes, sir.

Int. 20. What is the quality of the work, in your judgment, as done on the Thompson shoe by the Colt's armory cutter No. 4?

Ans. Well, where it hasn't been tampered with I call it good, fair, medium work. By tampering I refer to the place on the black side where the stitch wheel has broken the rand up.

Int. 21. Please examine the cutter now shown you and state

whether you have ever trimmed a shoe-sole edge with it; and if any shoe so trimmed by you is present please indicate which.

Ans. Yes, sir; this is an edge I trimmed with it.

The cutter produced is put in evidence and marked Defendants' Exhibit Stephenson Molding Cutter, W. A. C., sp'l ex'r, and the shoe is put in evidence and marked Defendants' Exhibit Thompson Shoe No. 2, W. A. C., sp'l ex'r.)

Int. 22. What was the operation in a mechanical sense of this Exhibit Stephenson Molding Cutter? Does it or not work with a reasonable degree of convenience and efficiency in trimming sole edges?

Ans. Yes, sir.

Int. 23. Judging from your experience in the use of the Orcutt cutters when new and when worn away to the last stages of their use, what is your opinion about the top of the cutter acting as a guard to gauge the depth of the cut?

214 Ans. I don't think it acts as a guard. The cutter runs the best when about three-quarters worn out.

Int. 24. Please state whether or not it is feasible for the operator to make any depth of cut or to gauge the depth of cut by the way he holds the shoe.

Ans. He could cut as deep as he likes if it was clear through the sole.

Int. 25. Please examine the shoe now shown you, marked Defendants' Exhibit Corthell Shoe No. 12, and state whether or not the upper portion of the sole removed from the right-hand side thereof correctly represents the amount of rand usually removed before trimming the edge with the Orcutt cutter.

Ans. Yes, sir.

(Noon recess.)

Int. 26. Please explain as fully as you can the quality of work that could be trimmed with the Exhibit Thompson Sole and Rand Edge Trimmer, and how would such work compare with the work done by the Orcutt cutter.

Ans. All the advantage the Orcutt cutter has over this is the bead. This will do as good work as the Orcutt cutter. It has an advantage over the Orcutt cutter with setting the gauge and having the gauge at any thickness you like.

Int. 27. Was it or not customary to use this cutter with the guard locked in position for a given thickness of sole and in some cases to use it with the guard supported by a spring but not locked?

Ans. It would be the most practical to use it with a spring.

Int. 28. When it was used with a spring did the spring effect the trimming upon the fore part of the sole or upon the shank? And please explain just what the object of the spring was.

Ans. That spring applied to the shank only.

Int. 29. How was the cutter adjusted to give a uniform thickness to the fore part?

Ans. By setting that gauge—the slotted gauge attached to the fixed collar of the Thompson trimmer.

Int. 30. Please state whether or not you intended in your answer to Int. 26 to state that the Thompson rand and sole-edge trimmer could not be made to form a bead; and, if you did not so in-
215 tend, please state whether or not that kind of cutter was used with or without a bead-forming rand-cutter.

Ans. With bead.

Int. 31. Will or not the rand-cutter now in the Thompson rand and sole-edge trimmer form a bead like that produced by the Orcutt cutter?

Ans. Yes, sir.

Int. 32. Please state whether or not the Exhibit Thompson Rand and Sole Edge Trimmer forms what is known to the trade as a molded edge.

Ans. Yes, sir.

Int. 33. Have you ever done first-class trimming and trimming upon first-class work with the Thompson rand and sole-edge trimmer; and, if so, when and where, as near as you can state?

Ans. Yes, sir; at M. C. Dizer's, East Weymouth. I trimmed work over after the Busell machine in the year 1878.

Int. 34. What effect does time have upon the finished edges of shoe soles? Will it remain the same in appearance or will it gradually assume an appearance of inferiority of finish?

Ans. Well, I hardly know how to answer that. Most anything will get shop-worn, you know.

Int. 35. What are the facts about trimming sole edges with rotary cutters? Is it or not common to form creases or marks on the bottom in the act of trimming—that is, such marks as are shown on the bottoms of the shoes now shown you and marked Exhibits Corthell Shoes No. 2 and No. 5?

Ans. Yes, sir.

Int. 36. Is it considered anything unworkmanlike or detrimental for creases like these to be made on the bottom of the shoe in the act of trimming?

Ans. No, sir.

Int. 37. Does or not the bottom finishing by the buffing rolls or other abrasive material remove these creases?

Ans. Yes, sir; they can finish the bottom without disturbing the edge of the shoe. Some prefer it that way because the balance of the grain on the bottom of the shoe can be removed without breaking the edge. The proprietor of the shop where I am now working, Edmund White, Holbrook, prefers it that way.

216 Int. 38. What effect does time have upon sole edges that have been trimmed but not blacked or set? Will the edge remain as smooth for any great length of time after trimming as if it were blacked?

Ans. No, sir; they will dry and fuzz up.

Int. 39. Have they or not succeeded in making any better sole edges with the use of the Orcutt cutter than were made by other rotary cutters before the introduction of the Orcutt cutter?

Ans. No, sir; I don't think they have.

(Cross-examination waived.)

J. P. THOMPSON.

Attest: WM. A. COPELAND,
Special Examiner.

Deposition of Richard Stephenson.

BOSTON, *April* 3, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, and have you previously testified in this case?

Ans. Richard Stephenson; I have.

Int. 2. Please examine the tool now shown you, marked "Defendants' Exhibit Stephenson Moulding Cutter, W. A. C., spec'l ex'r," and state whether you have seen the same before; and, if so, what you know about it.

Ans. I have seen the same cutter before. I made this cutter myself. I made it thirteen or fourteen years ago to make circular wood mouldings for circular windows of buildings. When I made it I was working for William Barbour, of Lawrence, who wanted some circular wood mouldings for patterns for castings for machines. Afterwards it was used to make circular mouldings for windows. I used it myself for making mouldings for patterns, and so did Barbour, who made his own patterns. It was used whenever wanted during the year and a half that I worked for Barbour.

Int. 3. How did it happen that this cutter came into your possession after its use by Barbour?

Ans. Barbour died about seven years ago at Lawrence.
217 His wife sold what machinery and tools were salable. This cutter had been superseded by rotary moulding machines, and I took it and have had it ever since.

Int. 4. Was this cutter entire, or were any of the parts lost when you obtained it about seven years ago, as stated?

Ans. When I got this cutter there was only one cutter left in it.

Int. 5. Have you replaced the three cutters that were missing?

Ans. I have replaced them myself.

Int. 6. Which of the four blades now in the cutter, if either, is the one that was in it when you obtained it about seven years ago?

Ans. The original one is marked with the numeral "2" twice.

Int. 7. Is that blade marked "2" one which you made when you first made the cutter?

Ans. That I can't say, because we had to replace the cutters when they broke.

Int. 8. Has there been any change in the form of the stationary guards formed upon this cutter, except that produced by use, since you made it?

Ans. Not to my recollection.

Int. 9. How were the blades sharpened—that is, upon what part of them was the sharpening performed?

Ans. Right on the front of the blade.

Int. 10. By the front of the blade do you mean the end, so to speak, where the cutting part is transverse to the molded periphery?

Ans. I do; that is the way they were ground in sharpening.

Int. 11. How did this rotary cutter perform its work in moulding wood—that is, what was the quality of the work it produced?

Ans. It performed its work first-class.

(It is agreed that the flat disc attached to the tag with the cutter has been applied to the cutter for the purpose of trimming "Defendants' Exhibit Thompson Shoe No. 2," and was not used with the cutter for the purposes testified about by this witness.)

RICHARD STEPHENSON.

Attest: EUGENE HUMPHREY.

218 *Deposition of F. M. Stevens.*

BOSTON, *February* 23, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Frank M. Stevens; 38 years of age; No. 3 Huckins avenue, Boston; machinist.

Int. 2. How long have you been engaged in the occupation of machinist?

Ans. About twenty years.

Int. 3. During what portion of that time have you, if at all, been familiar with the manufacture and use of rotary cutters?

Ans. I have been familiar with the use of rotary cutters for sixteen years.

Int. 4. How long have you been manufacturing cutters like that in controversy in this suit?

Ans. I have been manufacturing cutters for about seven years of that description.

Int. 5. Please state whether or not during the sixteen years you have been familiar with cutters, as stated by you, it has been common to make cutters with more or less rake or overhang to the front edge of the teeth?

Ans. It has; varying in the rake from $\frac{1}{32}$ of an inch to $\frac{3}{8}$ of an inch. The one having $\frac{1}{32}$ overhang is for milling substance of great depth, and leaving strength to the tooth as well as smoothness to the cut.

Int. 6. Have you heretofore known of cutters like that now shown you, marked "Complainants' Exhibit Old Busell Cutter;" and, if so, how long have you known them?

Ans. I have known such cutters about eight years, like this exhibit, but have known cutters similar to this for nine years.

Int. 7. Have the cutters you have known for about eight years had the same or about the same rake or overhang to the edges of the teeth as the exhibit?

Ans. They have been about the same.

Int. 8. Suppose there was any benefit or advantage in giv-
219 ing a rake to the front face of the teeth, like that shown in "Complainants' Exhibit Busell Cutter (Orcutt pat., '81)," would the advantage be any different, any greater, or with any different results than is derived from the rake or overhang of the teeth in the "Exhibit Old Busell Cutter?"

Ans. There is no difference in the benefit or results.

Int. 9. Is there any difficulty whatever in milling metals held in milling machines with milling-cutters having a rake or overhang to the front of the teeth like that in said Exhibit Orcutt Cutter?

Ans. There is no difficulty whatever. If there is any difference it is in favor of the overhanging teeth.

Int. 10. Is there anything new or peculiar in the rake or overhang to the front edge of the teeth in said Exhibit Orcutt Cutter, from what was well known and in common use before 1879?

Ans. There is nothing new whatever.

Int. 11. In so far as relates to the overhang or rake of the teeth of rotary cutters is there any difference in the result or benefit when employed in a cutter having teeth milled with a channel or space between them below the base of all parts of the cutting portions of the teeth like that shown in Brown's patent of 1864, or when employed in a so-called ratchet-tooth cutter?

Ans. The benefit derived from pitching the tooth forward is it can be driven faster, will cut freer, and make a smoother surface than one in which there is no overhang. There is no difference in benefit in the overhang when employed in the two kinds of cutters inquired about.

Int. 12. Have you used cutters like the Exhibit "Busell Cutter, Orcutt pat. of '81," in milling metal? If so, please state the kind of metal they were used on and the extent to which they were used and how they performed their duty; and also if the cutters so used by you differed in any respects from these exhibits state the nature of the difference.

Ans. I have used cutters like Plaintiffs' Orcutt Cutter for milling Jessop's cast steel, taking off duplicates from cutters like plaintiffs' exhibit, on the face of molding tools. As to the extent, I took off about six hundred molding tools from cutters like plaintiffs', and
they performed their work satisfactorily. There was no dif-
220 ference, except in the configuration, which is old and well known in the Orcutt cutter.

Int. 13. In your last answer you speak of Jessop's steel. Please state whether it was high or low quality, hard, medium, or soft.

Ans. It was high quality, medium soft, having been annealed in ashes over night only.

Int. 14. Please state whether the annealing of tool steel in ashes, as stated in your last answer, is the usual way of preparing it for

working, or whether there are other ways of annealing it that render it easier to work.

Ans. Annealing it in ashes is not the proper way of annealing to make it soft and easy to work. One of the well-known ways of annealing steel to make it soft is by heating it in charcoal and allowing the charcoal to become red; also the steel to become red hot and to be kept in an air-tight furnace until it is perfectly cold. That is annealing steel soft.

Int. 15. Please state the nature or kind of metal from which the rotary cutters were made that were used by you in milling the Jessop-steel sharpening tools about which you have testified.

Ans. It was Bessemer steel, which cannot be hardened by any other process except case-hardening, and was the same quality of steel now used in making rotary cutters for trimming boot and shoe sole edges.

Int. 16. What were the prices or difference in prices between Bessemer steel and good cast steel, like the Jessop steel, at the time of your making those shaping tools, or what are the prices now?

Ans. About eleven cents difference in a pound. Jessop's was fifteen cents a pound and Bessemer steel was four cents per pound and are about the same now.

(It is agreed that the following copy of the affidavit given by this witness and used at a hearing on motion for a preliminary injunction shall constitute a part of his testimony-in-chief, but complainants' counsel objects to all those parts of the affidavit which relate to the equities on motion for a preliminary injunction on the ground that they are not pertinent on final hearing.)

221 I, Frank M. Stevens, one of the above-named defendants, being duly sworn, do on oath depose and say that my age is thirty-seven years. I reside in Boston, and my occupation is machinist and manufacturer of boot and shoe machinery, in which business I have been engaged for the past nine years, and I am one of the firm of F. M. Stevens & Co.

At the May term of said court in 1882 a suit at law was brought against my firm by the above-named complainant for infringing the patent of Orcutt, involved in the present suit. Said former suit was for making cutters for the Corthell Company; but it was never tried.

While I was, in 1882, making cutters for said Corthell Company Oscar L. Noble came to me and wished me to leave said Corthell Company and engage to make cutters and other shoe machinery for the Busell Trimmer Company, and as one of the reasons for my so doing he urged that he knew, as did Samuel N. Corthell, then present, that any one had the legal right to make cutters such as were then involved in the suit pending between said companies, and called the Orcutt cutter, and that he wished to employ me and said Corthell in order to force the Corthell Company into a compromise. I engaged to make said cutters for the Busell Company, as did said Corthell to sell them, as stated in his affidavit, which is now before

me, and in which I concur as true in all matters therein stated which relate to myself.

During the negotiations between said Noble, Corthell, and myself in relation to our engaging with the Busell Company said Noble stated that it was a great mistake that the said Orcutt patent had not been taken out in my name instead of Orcutt's, as I was the first one to get up the cutter. This was said in connection with my testimony which I had then given in the suit then pending between said companies on the Orcutt patent, in which suit I had testified that I made in August, 1878, cutters like the Orcutt cutter—that is, like the Brown and Sharpe cutter, but moulded to trim boot and shoe soles; which testimony was not only strictly true, but I have every reason to believe and do believe that I was the original and first maker of such a cutter; but I did not then believe and do not now believe that it constitutes a patentable invention, and hence I made no effort to patent it; but at the time of making said cutter the matter
222 of patenting it was talked over by myself, said Corthell, and D. Whittemore, at whose shop we then worked, and we were all of the opinion that it had no novelty over the Brown and Sharpe cutter.

As regards the consolidation of the Busell and Corthell Companies, as stated in the affidavit of O. L. Noble, it was generally favored for the reason then urged by said Noble that there was no protection except in the Orcutt patent, and that if the suit was tried on that patent the whole cutter business would become public property, and that it was better to consolidate than have everybody who wished making sole-trimming cutters.

Since leaving the Busell Company employ the firm of F. M. Stevens & Co. have been sued in this court by the Busell Company and our entire stock, machinery, and tools were attached, and a keeper was put in our place till we gave bond; but I am informed by our counsel that said suit has not been entered in court, but is marked "non-entry."

As regards the statements made by Noble in his said affidavit in regard to employment given me by the Busell Trimmer Company, I desire to state that, so far from my being benefited by the employment by the Busell Company, they agreed to give me thousands of dollars' worth of work, which they utterly failed to furnish, and that my firm and not said company have just cause of complaint in that behalf.

Just before the Busell Company brought their last suit at law against us, which was returnable at the May term, 1884, of this court, as above stated, said Noble told me that he would resort to every mean, dirty trick that he could to break up our business; and one Frank Woods, a director of the Busell Company, told us that unless my firm quit making rotary sole-trimming cutters they would spend ten thousand dollars to fit up and make rotary seam-finishers such as my firm had an exclusive right to make under patents granted to William Y. Ober.

FRANK M. STEVENS.

Attest: EUGENE HUMPHREY.
Special Examiner.

223 *Stipulation.*

It is hereby agreed, subject to the approval of the court, that Eugene Humphrey may act as special examiner in taking testimony for the defendants in the above-entitled action.

Evidence for Defendants, Taken Before Me, Eugene Humphrey, Special Examiner.

Present: J. E. Maynadier, Esq., of counsel for complainants; T. W. Porter, Esq., of counsel for defendants.

Deposition of Richard Stephenson.

BOSTON, *February* 23, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Richard Stephenson; 38 years; Wollaston Heights; machinist.

Int. 2. Please state how long you have worked at your trade, where you have worked, and the different branches of machine business at which you have worked.

Ans. Twenty-two years and over. I have worked in England and in America. The principal towns are Lowell, Nashua, Lawrence, and Boston; have worked on engine work, cotton and woolen machinery, boot and shoe machinery, printing machinery, and tools.

Int. 3. Please state the principal machine shops at which you have worked in this country and the classes of tools on which you have worked.

Ans. Nashua Iron and Steel Co., Whitehead & Atherton's, of Lowell; Pacific Mills, in Lawrence; Whittemore's, and at Mellen Bray's, in Wollaston, and for F. M. Stevens & Co., in Boston; have worked on tools such as used in the shops, machinists' tools, such as cutters, mills, reamers, and taps.

224 Int. 4. Please examine the two exhibits now shown you, one marked "Defendants' Exhibit Milled Iron Bar, E. H., spec'l ex'r," and one marked "Defendants' Exhibit Milled Composition Bolt, E. H., spec'l ex'r," and state whether you have seen them before; and, if so, where and when and what you did with them or to them, if anything.

Ans. I have seen them before, on Saturday, the 21st of February current, at the shop where I work, at F. M. Stevens & Co.'s, these defendants. I made them.

(Defendants' counsel now puts in evidence the exhibits referred to.)

Int. 5. In making these exhibits how did you produce the milled depressions or channels which are marked "1" and "2" in each? And, if the cutters with which they were milled are before you, please state which ones they are.

Ans. I cut the depression with the cutter. The depression No. 2 in each of the exhibits was produced with this cutter (now introduced and marked "Defendants' Exhibit Stephenson Cutter No. 2"), and the depression No. 1 in each of the exhibits was produced with this cutter. (Cutter pointed out by witness now introduced and marked "Defendants' Exhibit Stephenson Cutter No. 3.")

Int. 6. Please state, if you know, of what metal or material these two exhibit cutters (Stepenson No. 2 and No. 3) are made.

Ans. Made of Bessemer steel.

Int. 7. Please state the number of revolutions per minute made by these cutters in milling the Exhibits "Milled Iron Bar" and "Milled Composition Bolt."

Ans. Eighty revolutions per minute.

Int. 8. What length of time was required in milling each of the channels in the Exhibits "Milled Iron Bar" and "Milled Composition Bolt?"

Ans. The rough milling took five minutes—that is, the "No. 1"—and the smooth milling, the "No. 2," took four minutes.

Int. 9. You speak of the No. 1 grooves being rough and the No. 2 smooth. Please explain, if you know, why one was rough and the other smooth.

Ans. No. 1 was done on an old-fashioned milling machine fed by hand. The machine was almost worn out; that is the reason why the milling is rough. The No. 2 was done on an automatic
225 milling machine or otherwise self-feeding machine, and what is called a first-class machine; that is the only reason.

Int. 10. Which, in your judgment, is the more difficult to mill and the more trying to the tool, the composition or the iron? And state any reasons you have for your opinion.

Ans. The composition. The reason of my opinion is the practical experience I have had with both.

Int. 11. Is there any practical difficulty whatever in milling metals with cutters like the Exhibits Stevenson's Cutters No. 2 and No. 3?

Ans. No.

Int. 12. Please state whether or not a Bessamer steel-cutter is equal, in point of strength and endurance in milling metals, to one made of first-class cast steel?

Ans. No; it is not equal.

Int. 13. Please state whether or not you have seen shoe-sole trimming-cutters employed to shape, by milling, the ends of chasing tools of hard, high-quality steel, to be employed in shaping other cutters?

Ans. Yes, sir; I have, and have done it myself.

Int. 14. Please state whether, in your experience as a machinst, it has or not been the custom to make milling tools with more or less rake or overhang to the front edge of the teeth; and, if so, for how long a time.

Ans. It is practical with all machinists to make the cutters with more rake; with a machinist that knows his business.

Int. 15. Have you ever had any experience in cutting leather by machinery? And, if so, please state where and to what extent.

Ans. Yes, sir; on the Pacific mills, in Lawrence, covering wooden rolls for worsted-spinning, and turning them off and finishing them and covering friction pulleys for driving machinery.

Int. 16. Is there any difficulty whatever in cutting leather by proper tools in such cases?

Ans. No, sir; not by any ordinary skill.

Int. 17. Please examine the cutter now shown you, marked "Defendants Exhibit Colt's Armory Cutter," in connection with the cutters marked "Complainants' Exhibit Busell Cutter, Orcutt pat. of '81," and state your opinion of the relative strength of the thin portion of the teeth in the two cutters, taking into consideration the height of the teeth and their thickness at the base. By thin portion of the teeth in the Orcutt cutter is meant the "rand lip," and in the Colt's Armory Cutter that portion of the teeth next the recessed side of the cutter.

226

Ans. These are the strongest cutters (witness referring to Orcutt cutters.)

(It is agreed that the following copy of the affidavit given by this witness and used at hearing on motion for a preliminary injunction shall constitute a part of his testimony-in-chief.)

I, Richard Stephenson, of Quincy, Mass., being duly sworn, do on oath depose and say that my age is thirty-eight years and my occupation machinist. I have for the past sixteen years been employed as a tool-maker at Lowell, Lawrence, and Boston, Mass., and Nashua, N. H., a large part of my work during that period having been the making of rotary cutters for use upon metal, wood, and plaster of Paris for moulded cornices.

During this period the Brown and Sharpe rotary cutter, patented in 1864, was well known and extensively used, and, but for the well known fact that it was patented, more cutters of that kind would have been made. During said sixteen years it has been the common practice to make rotary cutters of great variety of transverse peripheral outline, and with teeth adapted to be sharpened by grinding the flat front face by means of a small emery wheel or disk, and I now present as an exhibit a rotary cutter, marked "Defendants' Exhibit Stephenson Cutter, W. A. C., N. P.," which I made between thirteen and fourteen years ago, which is well adapted to be sharpened, without drawing the temper, by grinding the front face of the teeth with an emery disk, and it has been the practice to sharpen this class of cutters in that way since small solid emery disks came into use for sharpening cutter tools and similar purposes, as well as to grind them on the top, both methods of sharpening having been since then practised. When cutters are made with deep spaces between the teeth, like the Brown and Sharpe, the teeth may be ground by an automatic machine, and when made like my exhibit the cutter is held in the hand to sharpen the teeth by such grinding, and it is noways difficult to do, and the grooves may be

cut deeper and deeper by such grinding, if desired; and when
227 fine teeth are required it is the better way to form the teeth like my exhibit, but when coarse teeth or but few teeth, comparatively, are required, it is the better way to form the grooves like Brown and Sharpe's; but both methods have been equally well known for the time stated, though the Brown and Sharpe method is of comparatively recent date, it having been patented in 1864, while the other method is very old.

Any person of the most ordinary skill in making rotary cutters can make a cutter of either kind of teeth to mould any outline that can be moulded if they only have a sketch, sample, or figure of such desired outline to be formed by the cutter to be made.

It having been common, as I am informed, for many years prior to Orcutt's patent of March 1, 1881, now before me, to trim shoe-sole edges with rotary cutters, and the Brown and Sharpe cutter having been then known for seventeen years, and shoe-sole trimming tools having precisely the same transverse outline as that shown in said Orcutt patent having then been known for many years, as I am informed, there could be nothing required but the most ordinary shop skill to make a cutter like the so-called Orcutt cutter at the time of his patent.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 18. Why did you file or grind off portions of the top of the teeth in Exhibit Stevenson's Cutters No. 2 and No. 3?

Ans. One was ground off, ground back, and the other was not—No. 3 was ground off, No. 2 was not—to see if one would cut better than the other would, and we found that it made but a slight difference.

Cross-int. 19. Do you think that a clearance is essential in a milling-cutter?

Ans. Yes, sir; it is.

Cross-int. 20. How was the clearance obtained in that part of Stevenson's cutter No. 2 which is farthest from the center on the hub side?

Ans. There is no clearance.

Cross-int. 21. Did you ever make rotary cutters for the defendants like Exhibits Stevenson's Cutter No. 2 and No. 3?

Ans. Yes; I have made cutters for them of that kind.

228 Cross-int. 22. Please state how the tool is made which is used to turn the cutter blank before the slats are cut to form the teeth.

Ans. The tool is made in a vise and formed up by a file.

Cross-int. 23. About what are the dimensions of the steel used to form that tool?

Ans. The steel used to form that tool is half inch wide, inch and one-quarter deep, and hammered out at the end to any required width which is necessary to make the cutter.

Cross-int. 24. As to the strength of the Exhibit Busell Cutter,

Orcutt pat. of '81, and Colt's armory cutter, how do you think the bases of the teeth compare for strength?

Ans. The bases of the teeth are stronger in the Colt's armory cutter than the Busell cutter in comparison with their width.

Cross-int. 25. Where were you working on the 7th of June, 1884?

Ans. Working in Boston, for F. M. Stevens & Co.

Cross-int. 26. How does the present Exhibit Stephenson Cutter differ from the one produced by you when you gave your affidavit? And please state what you know as to who made the present Exhibit Stephenson Cutter.

Ans. There is no particular difference between this and the original, except that the cut on this does not extend quite so far around as on the original. I know where it was made, but the man that made it I do not know.

Cross-int. 27. Can you tell from examining Colt's armory cutter whether the two ridges which form portions of the teeth were both meant to form grooves in the metal to be milled?

Ans. Yes; I can. They are not both meant to form grooves, but still with the cutter they can make two grooves if they want to; but practically the cutter is made to make a mold.

Cross-int. 28. Was not the smaller of the two ridges made to make a groove, in your opinion?

Ans. No; not by itself. It was made to make a groove, in combination with the other part of the cutter to form a shape.

Redirect:

Int. 29. Please state how many cuts were made in each of the several channels shown in Exhibit Milled Iron Bar and in Exhibit Milled Composition Bolt—that is, how many times you went through them with the milling-cutter.

229 Ans. The composition bolt No. 1 was done at one cut. No. 2 composition bolt was done at one cut. No. 1 on the iron piece was done at one cut. No. 2 was done at two cuts. The reason why we had to take two cuts on No. 2, the platen moved that we had the piece fast in after we began to cut, and therefore we had to go over it once more.

RICHARD STEPHENSON.

Attest: EUGENE HUMPHREY,
Special Examiner.

(It is agreed that the following copies of affidavits of Milton L. Eddy and John G. Buzzell, taken on behalf of defendants for use at the hearing on motion for preliminary injunction, be introduced as their depositions on final hearing.

Also that defendants may introduce the following copies, taken from two affidavits of O. L. Noble and one of Wm. D. Orcutt, given in behalf of complainants in the hearing on a motion for preliminary injunction in suit of Busell Trimmer Co. *et al. vs.* —— —— and used

in the hearing on motion for preliminary injunction in this case, marked as Exhibits B, C, and D, respectively.)

EUGENE HUMPHREY,
Spec'l Exam'r.

Deposition of M. L. Eddy.

I, Milton L. Eddy, of Boston, Mass., do on oath depose and say that my age is forty-eight years. I am a member of the firm of Eddy, Walker & Co., successors to Eddy, Sherman & Co., manufacturers of and dealers in boot and shoe machinery, in which business I have been engaged for the past fifteen years.

In 1880 my firm was engaged in making and selling rotary shoe-sole trimming machines and cutters under the Corthell patent No. 236,145, dated Jan. 4, 1881.

We made a few cutters without the rand lip, which was separate from the rest of the cutter, after which we made the cutter with a rand lip, and also put a separate rand lip or cutter on the lower arbor, as shown in that patent. These cutters when made with a rand lip as part thereof are the same in all substantial respects as that shown in the Orcutt patent No. 238,303, involved in the present suit.

230 On the twenty-eighth day of August, 1880, the Busell Trimmer Company brought a suit at law against us on eight patents, one of which was the Tayman reissue No. 9073, and attached our stock in trade, tools, machinery, and all other property. This attachment we dissolved by giving bond.

Said company then, on Dec. 30, 1880, brought a suit in equity against George E. Keith, one of our customers, on said Tayman patent for using said cutters bought of us, and in January, 1881, they brought another suit in equity on the same patent against F. E. White, another of our customers, for using the same cutters bought of us. We assumed the defence of both said suits in equity, and the suit against Keith was heard — a motion for a preliminary injunction, which was denied.

During this time and until May, 1882, said Busell Trimmer Company spared no pains and seemingly left no means untried to bulldoze the public interested in shoe machinery into the theory and belief that said Tayman reissue patent controlled the right to make and use cutters like the Orcutt cutter, for both they and we made precisely the same cutter that the parties to this suit now make, and they notified the public and proclaimed on all occasions where the question arose that said cutters made by us were an infringement of said Tayman patent, and they then insisted and declared with as much vigor that all such cutters were controlled by the Tayman patent, as they now insist in public that the Orcutt patent is the controlling patent in regard to such cutters.

The Corthell Company, after it was formed, acquired the Corthell patent and the cutter business which my firm had carried on under it, when the Busell Company brought another suit in equity against it on the Orcutt patent, in which suit both parties took testimony

which terminated Oct. 12, 1882, but the complainant never took rebutting testimony, but instead commenced negotiating for a compromise and intriguing to break up the business of the Corthell Company by offering and paying higher wages to their skilled cutter-makers and salesmen than they were receiving, and finally by such means forced that company into a compromise and consolidation with a settlement of said suit at law and the two suits in equity then pending on the Tayman patent and the suit at law
231 against Stevens *et al.* and the said equity suit against the Corthell Company in the Orcutt patent as also an agreement not to prosecute any customers of any of said defendants who had used said cutters.

This compromise was an inequitable, unjust, and unfair transaction, brought about by the sharp practice of the Busell Company's managers in tampering and meddling with the affairs and workmen and employees of the Corthell Company; and it was only acquiesced in finally as a bitter alternative by reason of the superior financial means of the Busell Company, who threatened to hire off any help that the Corthell Company might employ, and also to so reduce the price of cutters as to leave no profit thereon.

I and my partner, Mr. Walker, opposed said compromise to the last, and sent a formal written protest against it as a stockholder in the Corthell Company for the reason stated in said protest, a copy whereof is hereto annexed, marked "Exhibit A," and because I was then and am now positive that the Orcutt patent, in view of the well-known state of the art when it was granted, was in fact a fraud upon the public for the reason that it contained no patentable novelty whatever.

And one of the reasons urged in private by the Busell Company's manager for the compromise was that to try the suit on the Orcutt patent would be to make that patent public property; and they freely admitted that the evidence taken would destroy the patent, as it showed that the patent possessed no patentable novelty whatever.

I have no other interest in this suit.

MILTON L. EDDY.

UNITED STATES OF AMERICA.

DISTRICT OF MASSACHUSETTS, *County of Suffolk*, } ss:

Then personally appeared the above-named Milton L. Eddy and made oath that the foregoing affidavit by him subscribed is true.

Before me—

EBEN HUTCHINSON,
Notary Public.

[SEAL.]

Boston, June 7, 1884.

232 *Deposition of John G. Buzzell.*

I, John G. Buzzell, of Lynn, Mass., being duly sworn, do on oath depose and say that my age is fifty-four years and my business the manufacture and sale of boot and shoe machinery, in which I have been engaged for the past fifteen years. Previous to that period I was engaged in using and operating other machinery involving the extensive use of rotary cutters.

I have taken out upwards of a dozen patents on inventions of my own, a large proportion of which were for devices for finishing boot and shoe soles, and I am familiar with the art of manufacturing boots and shoes by machinery.

It has to my knowledge been a common and well-known practice for thirty years to employ rotary cutters for forming irregular surfaces of great variety of configuration of cross-section, the first use of such cutters having been for forming mouldings for architectural purposes in which cutters were and are employed which have very sharp ridges, deep depressions of all kinds of simple and compound curves and angles in their outline of cross-section.

Since the introduction of the Brown and Sharpe patent cutter it has been common to form cutters with either open grooves, as shown in the Brown patent of 1864, or with grooves which did not extend below the roots or base of all parts of the teeth, as shown in the cutter now before me, marked "Defendants' Exhibit Stephenson's Cutter, W. A. C., N. P." Either of these cutters can be sharpened by grinding the flat front face of the teeth with a small emery wheel, the only difference being that the Brown & Sharpe cutter may be ground either by holding it in the hand or by an automatic grinder, while the other kind is held in the hand when being ground. The reason of making these two kinds of cutters is the fact that when fine teeth are deemed best and are formed in the cutter there is not room for the deep, open slots, as there is when less teeth are employed; but each kind of cutter has been equally well known for twenty years, or about that time.

233 The art of trimming shoe soles by machinery dates back in this country many years, but its greatest development has been in the last ten years, and during several years it was claimed that all rotary cutters were controlled by the Tayman patent.

In my opinion, based upon my experience as an inventor and mechanic and a user of rotary cutters, and in view of the previous use and knowledge of rotary cutters of great variety for trimming shoe soles, among which are the Coté patent cutters, the Knights patent cutter, the Corthell cutter, the Tayman cutter, the J. H. Busell cutter, the Dunham shoe-edge plane, and others, there could be no invention and only the ordinary shop skill of an ordinary mechanic in forming on the face or periphery of a Brown and Sharpe cutter the outline shown in Orcutt's patent of March 1, 1881, No. 238,303, for its outline or cross-section was for years before that time old and well known in shoe-sole trimming tools; its teeth and the grooves

or spaces between them are old and well known; and it performs nothing new, and it has for many years before the date of that patent been the most common practice to form any desired outline on the face of cutters having teeth either like the Brown and Sharpe cutter or like said Exhibit Stephenson Cutter.

And if Orcutt could obtain a legal patent on that cutter, then any man can obtain a legal patent every time he forms a Brown and Sharpe cutter with a face which had not before been formed on that kind of a cutter.

JOHN G. BUZZELL.

Boston, June 7, 1884.

UNITED STATES OF AMERICA.

DISTRICT OF MASSACHUSETTS, *County of Suffolk*, } ss:

Then personally appeared the above named John G. Buzzell and made oath that the foregoing affidavit by him subscribed is true.

Before me—

[SEAL.] WILLIAM A. COPELAND,
Notary Public.

234 EXHIBIT B.

Deposition of Oscar L. Noble.

Oscar L. Noble, of lawful age, being duly sworn, says:

I am superintendent of the Busell Trimmer Company, one of the complainants, and have been for over four years last past actively engaged in the manufacture and sale of rotary trimmers.

I am familiar with all rotary trimmers which have been used to any extent in this country, and have made the state of the art my constant study since my first connection with the trimmer business in 1875, and have no doubt that I am fully cognizant of it.

I am familiar with letters patent reissue No. 9073, dated Feb'y 10th, 1880, and have carefully examined the original letters patent No. 136,790, dated March 11th, 1873, and the model in the Patent Office on which that patent was granted.

I have also made an extremely full and careful search as to the novelty of the cutters described in that patent, and have found nothing tending to show that a rotary welt knife of any kind is not wholly new with Tayman, the original patentee.

The most important features of the present rotary trimmer are the cutters; and these cutters are all made under the Tayman patent reissue No. 9073. In fact, all rotary trimmers now in use, except a very few, I feel very sure not over a dozen, in all, have rotary welt knives substantially the same in all respects as that described in the Tayman reissue and represented in the second, fifth, and sixth clauses of claim.

In trimming sole edges by hand two tools are generally used, one called a rand or welt knife, the other an edge plane or knife.

Taking out the rand or welt is trimming off the upper corner of the sole between the sole and the upper. Tayman's machine is the first that I ever heard of which would take out the rand or welt.

In practice these cutters are mostly made to trim both the edge and welt; but they are sometimes made separate—that is, one adapted to trim the welt only and the other adapted to trim the edge only. Our customers prefer generally to have the two combined in one cutter, but sometimes a customer will desire a separate welt knife.

235 All our machines have rotary cutters, substantially the same as those referred to in the 5th and 6th clauses of claim of the Tayman reissue, and we have on several occasions furnished our customers with rotary cutters which are adapted only for taking off the corner of the sole near the upper, as described in the second clause of claim.

I have no doubt that a rotary trimmer without a rotary rand knife is of very little value compared with ours having such a knife.

About two months ago rotary trimmers were first put upon the market in infringement of the Tayman reissue, and the defendant Keith was the first to use such a machine, so far as I know or believe. I saw him personally and told him that he was infringing, and that we should be obliged to sue unless he stopped. I saw and carefully examined his machine—he had but one then (this was about eight weeks ago)—and saw on that machine a cutter in all respects substantially the same as that described in the Tayman patent and represented in the second clause of claim. The rand guide marked "N" in the Tayman patent was used with this cutter.

The machine was in use when I saw it. It had two horizontal shafts, one above the other. The rotary welt-cutter was on the lower shaft and the rotary edge-cutter on the upper shaft.

O. L. NOBLE.

UNITED STATES OF AMERICA.

STATE OF MASSACHUSETTS, *Suffolk County*, } ss:

BOSTON, *Dec.* 30, 1880.

Personally appeared the above-named Oscar L. Noble and made oath that the statement above made and signed by him is true.

Before me—

[L. S.] WILLIAM A. COPELAND,
Notary Public.

236 EXHIBIT C.

Deposition of Oscar L. Noble.

OSCAR L. NOBLE, of lawful age, being duly sworn, says:

I have already made an affidavit in this case.

The cutter marked "Corthell Exhibit Miter Cutter" is worthless for trimming sole edges even with the rand guide, which is attached to the same tag.

A tool for taking out the rand or welt must necessarily consist of a cutter and a rand guide or guard, because the tool must be forced between the upper and the sole, and the cutter would destroy the upper if it were not for the rand guide or guard.

The rand guide is commonly a thin disc of metal, such as is shown in Exhibit Corthell Miter Cutter and Orcutt 3, and performs always two duties: (*a*) it guides the shoe; (*b*) it prevents the cutter of the welt-trimmer from injuring the upper; consequently it is called both a rand guide and a rand guard. "Rand" means strictly the welt, but is commonly used to mean the upper surface of the sole near the edge and next the upper, and frequently to mean the angle included by the upper surface of the sole and the outer surface of the upper.

The Corthell Exhibit Miter Cutter is far too thick for use with a rand guide as a welt-trimmer—full three times too thick—and it is certain that any man practically acquainted with the art of trimming shoe soles would know at a glance that that cutter is not adapted for use with a rand guide.

The tool marked "Pollard Exhibit Cutter" may possibly trim a sole edge as a feat, but the cutter proper in that tool was never designed for any such use, and is practically worthless for such use. It obviously could not be used at all with the rand guide, and the bottom guard is also an important addition to it, so far as practical use is concerned. The tool with these two additions is obviously adapted for wholly different uses from those for which the cutter alone is adapted.

Milling-cutters for metal work are well-known, and the cutters of Exhibits Corthell Miter Cutter and Pollard Cutter are mill-
237 ing-cutters. A few years ago I took great pains to examine samples of all milling-cutters then in use, and found a large variety of styles, but I could not find one with inclined cutting edges close up to the flat side of the cutter, as in Exhibits Orcutt 2, 3, and 4, the Tayman cutter F², and the cutters used on the Busell and Corthell machines, with the exception of miter-cutters much like Exhibit Corthell Miter Cutter, very much too thick for the cutter of a welt-trimmer, and never intended nor at all adapted for use as part of a welt-trimmer.

A rotary cutter to be adapted for any practical use in trimming welts must be so thin that its thickness added to the thickness of the rand guide will not make the tool too thick to enter between the upper and sole, and the cutting edges must extend close up to the flat side of the cutter which goes next to the rand guide and be inclined towards the axis of the cutter.

So far as I know or believe, or have any reason to believe after an exhaustive investigation, Tayman was the first to make such a cutter and such a tool.

* * * * * * *

EXHIBIT D.

Deposition of William D. Orcutt.

WILLIAM D. ORCUTT, of lawful age, being duly sworn, says:

I live in Boston, Mass., and am a machinist, and have been for over twenty years. I am and have been for over fifteen years familiar with metal-working tools.

The cutter shown me, marked Corthell Exhibit Miter Cutter, is a tool for mitering the edge of a piece of metal, and is properly shaped for this purpose. The tops of each of its teeth are formed of two surfaces which are at an angle to each other. The narrow surface near the cutting edge of each tooth serves to give the necessary strength to that edge, and is essential in a metal-cutter.

I have known these miter-cutters just like the Corthell Exhibit Miter Cutter for many years, but I never knew or heard of
238 such a cutter being used with a rand guide or anything like a rand guide or having an edge like the edge of a saw tooth. In fact, the only saw-toothed cutters ever used for sawing metals are made of thin sheet steel and are saws and not cutters, and these circular saws for sawing metal, except when made of small diameter, have two surfaces on top of each tooth like the Corthell Exhibit Miter Cutter.

The stock to be mitered is always a trifle narrower than the width of the cutter.

I am familiar with the reissue patent No. 9073, dated Feb. 10th, 1880, for machine for trimming the soles of boots and shoes, and understand the machine described in it.

The cutter F^2 described in that patent is exactly the same as the small ridges on one side of the large cutter on Exhibit Corthell Machine. I mean the ridges which come next the rand guide—that is say, if you take off a thin circular slice from the large cutter in the Corthell machine, so as to divide the large cutter into two cutters, the thin slice next the rand guide will be the same tool in substance with the rand guide as the tool formed by the cutter F^2 and rand guide N of the Tayman reissue. These two tools will not only be the same in substance, but will be almost exactly the same, the only difference being that the inclined cutting edges of the Tayman welt-trimmer are longer than in the slice from the Corthell machine-cutter, and that slice is cut down, as shown by the dotted lines marked *a a* in the drawing marked Exhibit Orcutt 1, herewith produced, which is a plan enlarged for clearance of that surface of the Tayman cutter F^2 which comes next the rand guide in Tayman's rotary welt-trimmer, the dotted lines showing one of the changes made in the cutter of the Corthell machine.

This change is made in the Corthell tool in order that the cutter may be more easily sharpened.

A circular slice from the cutter marked Exhibit Orcutt 2, now produced, is exactly like the Tayman cutter F^2, except the cuts marked *a a* in the drawing Orcutt 1. These cuts *a a* were used in

tools for sole-edge trimmers made by the Busell Trimmer Company as early as 1878.

I never knew of any tool substantially the same as the cutter F^2 of the Tayman patent before 1878, and I am very sure that
239 no such tool was every used in metal-working, either separately or in one piece with another cutter—that is, like the large cutter of Exhibit Corthell Machine or Orcutt 2.

Such tools, Tayman's F^2, the large cutter of Exhibit Corthell Machine, and Orcutt 2, are not fit for use in metal working, and they couldn't be used on soles without a rand guide.

The operation of the rotary welt-trimmer of Tayman, by which I mean the cutter F^2 and rand guide N, is exactly the same as the operation of the rotary welt-trimmer made up of a rand guide and that side of Orcutt 2 which comes next the rand guide, and is the same in substance as the operation of the rotary trimmer made up of the rand guide and that side of the large cutter of Exhibit Corthell Machine which comes next the rand guide, but the latter cuts out, of course, very much less than the two former, for it, in fact, simply takes off the corner of the sole next the upper, making what is called a bead, because the length of the inclined cutting teeth is less than the length of the same teeth in Tayman F^2 and Orcutt 2.

The tool marked Pollard Exhibit Cutter cannot be used in metal work of any kind, and such tools are unknown in metal work, but the cutter in that tool is the same in substance as cutters I have been familiar with for many years for making chasing tools. It will be seen that the cutter in Pollard Exhibit Cutter is shaped on both sides as well as on its periphery, and it is clearly a cutter for metal work and not for trimming sole edges.

A slice taken off that cutter would be nearer to the cutter F^2 of the Tayman welt-trimmer than the Exhibit Miter Cutter, but it would be substantially different from the cutter F^2 of the Tayman trimmer, for one side of the cutter F^2 is flat and the other side beveled and toothed, while in the slice from the cutter of Pollard Exhibit Cutter the side corresponding to the flat side of Tayman's cutter F^2 is bevelled and toothed in a manner peculiar to metal-working cutters, and never used, so far as I know, in cutters for sole edges. If you grind off that side of the cutter in Pollard Exhibit Cutter next the rand guide until it becomes flat and the teeth on that side are all ground off and then take off the slice, that slice, will be substantially the same as Tayman's cutter F^2, and if you combine the slice thus obtained with a rand guide you will have Tayman's welt-trimmer.

240 As to the cutter in Pollard's Exhibit Cutter, it is not like the Tayman cutter, unless the side next the rand guide be ground off flat, and it is worthless for making chasing tools if it be so ground off.

The welt-trimmer on Exhibit Corthell Machine is substantially the same in construction and mode of operation as the Tayman welt-trimmer, for both consist of a rand guide and a rotary cutter whose edges are inclined towards the axis of the cutter. The cutter in the welt-trimmer that was used in the first Busell edge-trimmers, made

several years ago, had more than two cutting teeth. I myself saw a dozen or so of cutters which had more than two teeth each exactly like the teeth in the cutter of the welt-trimmer in the Corthell machine, made in 1876 for the Busell trimmer, but for several years all the welt-cutters used in the Busell trimmer were, so far as I know, made with but two teeth, just like the welt-trimmer now produced and marked Orcutt 3, and I have myself made welt-trimmers for the Busell machine, of which Orcutt 3 is a sample.

These welt-trimmers, Orcutt 3, are commonly used with the cutter Orcutt S, but over a year ago I applied a welt-trimmer just like the Orcutt 3 to the lower shaft of a Busell trimmer, so that it took out the rand only without trimming the edge, and, moreover, it was on a different shaft from that which carried the large cutter.

The teeth in Orcutt 3 and the teeth in the welt-trimmer of Exhibit Corthell Machine are exactly alike, and they both contain the inclined cutting edge of the Tayman cutter F^2, but in addition this cutting edge is sharpened more on the side next the rand guide, and the teeth are not filed away like saw teeth, but are left as wide at the top as at the bottom, so that they may be ground oftener without destroying the cutter.

These welt-trimmers (Orcutt 3 and that of Exhibit Corthell Machine) contain every feature of the Tayman welt-trimmer with two improvements, both of which were made years ago for the Busell trimmer. These two improvements are, first, the Tayman tooth is sharpened more on the rand-guide side, and, secondly, that the Tayman tooth is built out so that the edge may be resharpened oftener than is possible with the Tayman cutter F^2. Exhibit Orcutt 4 is a cutter with four teeth, one of which is the Tayman tooth, the next
241 the Tayman tooth with the addition of metal to make it the same shape as the tooth of Orcutt 3, the third the Tayman tooth sharpened more on the side next the rand guide, and the fourth the tooth of Orcutt 3, which is the Tayman tooth built up and sharpened more on the rand-guide side.

WM. D. ORCUTT.

DISTRICT OF MASS., *Suffolk*, } *ss:*

BOSTON, *April* 4, 1881.

Personally appeared the above-named Wm. D. Orcutt and made oath that the foregoing affidavit made and subscribed by him is true.

Before me—

[L. S.] WILLIAM A. COPELAND,
Notary Public.

Deposition of Alban Andrén.

BOSTON, *April* 13, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Alban Andrén; 40; Beverly, Mass.; patent solicitor and mechanical expert.

Int. 2. What experience have you had, if any, in relation to the theory or practice of mechanics—of inventions and obtaining patents thereon—and as a mechanical expert in patent causes?

Ans. I graduated from the Institute of Technology at Gothenburg, Sweden, after a three years' course; afterwards worked five years in the mechanical works of Keiller & Co., Gothenburg, Sweden, part of the time as a machinist, then as draughtsman and designer of machinery, and finally for about nine months as foreman. We had four hundred men in this shop and made engines and general machinery—wood and iron working machinery. In my employment there I was accustomed to make and use rotary cutters for metal and wood work. I afterwards worked a year and a
242 half in the machine shop of Coulthard & Sons, Blackburn, Lancashire, England; part of the time as a machinist and part as draughtsman. Then I worked with the Brainard Milling Machine Co., Hyde Park, Massachusetts, part of the time in the shop and part in the office as draughtsman, in which shop milling machines, on which rotary cutters or milling tools are used, formed the principal product of said shop. For the last fourteen years I have been employed as a patent solicitor, and in that capacity I have investigated, given advice upon, and procured patents for a great many inventions pertaining to the boot and shoe trade, including edge-trimming, buffing, and burnishing machines. I have also frequently acted as an expert in the United States circuit court in suits pending therein, and in such capacity have testified in cases pertaining to the art of making boots and shoes.

Int. 3. Have you examined and are you familiar with and do you understand letters patent of the United States No. 212,971, issued March 4, 1879, to William D. Orcutt for rotary cutter for trimming shoe soles, and letters patent of the United States No. 238,303, issued March 1, 1881, to said Orcutt for rotary cutter for trimming the edges of boot and shoe soles? If so, please state whether you do or not find any mechanical features in said last-named patent which are not found in the first-named patent, except that in the last-named patent the teeth are shown as inserted in a central hub, while in the earlier patent the teeth are formed integral with the hub. In giving your answer please state what are the principal features which you find in said patents respectively.

Ans. I have examined the said patents and I understand them, except that the teeth in later patent are inserted into grooves in the hub. They are substantially and precisely alike in that in both I find on the periphery of the cutter a number of blades each having a flat front face, a slightly eccentric outer or peripheral end molded throughout uniformly and having end ridges extending circumferentially across said face, and in practice both cutters made in accordance with said patents perform the work of trimming the edges of boot and shoe soles precisely alike. I also find a further similarity in said patents in this respect: that the front faces of the teeth are made hooked or undercut.

Int. 4. In connection with these two Orcutt patents please
243 state whether you do or do not find anything embodied in

the claims of the later patent which is not shown in the earlier patent.

Ans. I find nothing embodied in the two claims of the later patent that is not fully shown in the drawings accompanying the earlier patent.

Int. 5. Have you examined and are you familiar with the letters patent of the United States granted to Joseph R. Brown on the 29th day of November, 1864, and numbered 45294; and, if so, do you understand the same?

Ans. I have examined it and I do understand it.

Int. 6. Please state, as concisely as you can, what you understand to be the essential features of the cutter shown, described, and claimed in that patent.

Ans. The Brown patent shows a new departure in making rotary cutters of any desired form, which consists in making the teeth molded throughout of a uniform form and located eccentrically on the face of the cutter, and having a proper clearance to permit the teeth to cut without binding, and so constructed that the flat front face of each tooth may be ground off to sharpen it without destroying or changing the molded cutting surface of each tooth. The shape of the teeth in the drawing is shown of the form commonly used for cutting gears; but such form forms no part of the invention and may be varied according to the nature of the work to be performed and the material to be cut without departing from the essence of the invention as enumerated above.

Int. 7. Please state what you understand to be the object or function of the ridges "1" and "2" and the portion of the cutting blades between said ridges, as shown in the Orcutt patent of 1881, when applied to the purposes there stated, to wit, the trimming of the edges of boot and shoe soles.

Ans. The function of the ridge "1" is to reduce or remove the upper portion of the sole at or near its junction with the "upper." The function of the ridges "2" "2" is to reduce or remove a portion of the sole between its outer edge and the bottom thereof, and the cutting blade between such ridges is for the purpose of trimming the outer edge or surface of the boot and shoe sole.

(Noon recess.)

244 Int. 8. Please examine the patent now shown you, No. 157,476, issued December 8, 1884, to James C. Knights for machine for trimming and burnishing boot and shoe sole edges, and state which of the features, if any, you find embodied in the cutters shown therein which is shown in the Brown cutter and in the Orcutt cutter about which you have testified.

Ans. It is similar to the Brown cutter in that each tooth has a flat front face, a molded outer end, and an eccentric or inclined top, with proper clearance, the teeth being capable of being ground on the flat front face, or, if so desired, on the outer molded surface. It has all the essential features, advantages, and functions of the Brown cutter. It is similar to the Orcutt cutter in that it is a rotary cutter for trimming sole edges, the blades of which are each provided with a

flat front face and a slightly eccentric outer or peripheral end, such teeth being molded throughout to a uniform shape the converse of the desired shape to be given to the sole edge. At one end of said cutting blades is a flange adapted to serve as a guide against the under side of the sole, the other end of the cutting blades having a rand disc for properly guiding the boot and shoe relative to the rotary cutter.

Int. 9. Please examine the patent No. 188,337, issued March 13, 1877, to J. H. Busell for heel and sole trimming machine, and state whether or not you find therein cutters adapted to trim the outer edge or bed of the sole, the upper surface next to the "upper," termed the rand, and the bottom next the edge, with such explanations as you see fit to give.

Ans. I do find such cutters all rotating together upon a common axis. The teeth of the bed-cutter are each provided with a flat front face and a slightly eccentric outer or peripheral end, such bed-cutter being capable of having its teeth ground upon their front faces precisely like the Brown and Orcutt cutters. The cutter or toothed edge for cutting or trimming the bottom of the sole has also teeth with flat front faces and a slightly eccentric outer or peripheral end capable of being ground on the front face as it wears out, substantially like the Orcutt cutter. It has also at the other end of the cutting blades a rand lip for cutting or removing a portion of the sole at the junction of its outer edge and the upper, substantially in the same manner and for the purpose shown in the Orcutt patents.

245 Int. 10. Please examine the cutter now shown you, marked "Defendants' Exhibit Thompson Rand and Sole Edge Trimmer," and state what elements you find in that adapted to perform the duties in edge-trimming which may be performed by cutters like that shown in the Orcutt patent of 1881.

Ans. In the Exhibit "Thompson Rand and Sole Edge Trimmer" I find the following instrumentalities in a rotary cutter for trimming the edges of boot and shoe soles, to wit, a series of blades for cutting the bed or outer edge of the sole, each such blade having a flat front face and a slightly eccentric outer or peripheral end moulded throughout to a uniform shape, the converse of the desired shape to be given to the sole edge, such bed blades terminating at one end as a series of cutting blades constructed and adapted to work in the same manner as the bed blades, but for the purpose of trimming the sole at the junction of its outer edge and bottom; such blades having also flat front faces, slightly eccentric outer or peripheral ends molded to the desired shape and capable of being ground on the flat front faces. At the other end of the bed-cutting blades are rand-cutting blades, with a bead on them to trim the edge of the sole at the junction of the "upper," all of the said cutters—that is, the bed-cutters, the rand-cutters, and guard-cutters—being capable and adapted to be ground on their front faces to sharpen them, substantially in the same manner as shown in the Orcutt patent. In addition to these elements I find in the said exhibit a circular rand gauge outside of the rand-lip cutters to prevent injury to the upper, precisely as shown in Fig. 4 of the Orcutt patent. In fact, I find in

said exhibit the combination of parts to operate and for the same purpose substantially as shown in the Orcutt patent.

Int. 11. Please examine the Tayman patent No. 136,790, issued March 11, 1873, and reissued Feb. 10, 1880, as No. 9073, and state whether or not you find therein what you deem to be a molded cutter or what would produce a molded edge upon a shoe sole; and please give your reasons for the conclusions you arrive at.

Ans. I would here say that I understand a molded edge to be any edge that is made otherwise than perfectly flat, and a molded edge therefore may be convex, concave, concavo-convex, such convexity or concavity to be composed of curves or a series of straight
246 lines coming together; and thus I find in the Tayman patent, in figure 11 of the original patent, cutters "F" and "F^1," constituting together a molded cutter for the purpose of giving to the sole edge the desired molded surface, for the same purpose and in the same manner as shown in the Orcutt patents of 1879 and 1881.

Int. 12. Please examine the three sections "F," "F^1" "F^2" of the cutter shown in the Tayman patent and reissue thereof and state whether or not there is any difference in those several sections of a cutter except in the obliquity of the periphery or cutting teeth of the different sections to the plane of the cutter.

Ans. No; there is none. The teeth of each have flat front faces, slightly eccentric outer or peripheral ends, and capable of being ground on their front faces without destroying the shape of the teeth; and they all have proper clearances or "backing off" behind the cutting surfaces."

Int. 13. Please examine the Patent Office copy of the file wrapper and contents in the matter of Orcutt patent of 1881, marked "Exhibit E," and state whether you find the subject-matter of either of the claims in said patent as issued in the specification or any amendment thereto until the amendment filed on the 4th of January, 1881, when all the specification, except the signatures, was erased and a new specification filed.

Ans. No; I do not find such subject-matter as contained in either of the claims issued in the patent. On the contrary, I find in the original specification claims merely for a peculiar manner of producing the backing off or clearance of the blades, consisting in first inserting the blades in the grooves of a construction hub, and after the blades had been turned while attached to such hub they were removed from the latter and inserted in a secondary hub, the operative hub, having grooves of a different angle as compared with the first one, and thereby produced the desired eccentricity of the cutting blades. There is nothing in the said original specification to indicate that Orcutt ever considered himself to be the inventor of anything but this method of raking the cutters when made detachable from the hub.

Int. 14. Please examine the cutter now shown you, marked "Defendants' Exhibit Stirckler Cutter," and state whether or not you consider the flat or right-line tops of the teeth the same in
247 substance as the curved but eccentric tops of the teeth shown

in the Orcutt patent of 1881 and in "Complainants' Exhibit Busell Cutter (Orcutt pat. of '81)."

Ans. They perform precisely the same function, from the fact that they all have cutting blades provided with flat front faces, the outer edge of which is molded throughout to uniform shape, the converse of the desired shape to be given to the sole edge and adapted to be ground on their front faces without altering the form of the cutting edge. They all show ridges at the end of the bed-cutting surface, and it makes no difference in the practical operation of the cutters whether the outer surfaces of such bed, rand, and guard cutters are eccentrically curved backwards or inclined in a straight line as long as the proper clearance is left back of the cutting edges.

Int. 15. Please examine the tool now shown you, marked "Defendants' Exhibit Bigelow Cutter," and state what elements you find therein which are shown in the Orcutt patent of 1881, and what, if any, are lacking.

Ans. I find in a hand tool all the elements of a single blade of the Orcutt cutter, to wit, a cutting blade having a flat front face and a slightly eccentric outer or peripheral end, having formed thereon end ridges with beads for trimming the edges of the upper and lower side of the sole, the said cutter being adapted to be ground on its front flat face without altering the form of the cutter. In its general outline the hand tool is precisely like the form of each blade in the Orcutt patent, namely, a convex bed, an inclined rand-cutter with a bead at its base, and an inclined guard-cutter with a sunk channel or bead; in fact, the Orcutt cutter is merely a change from a hand tool to a rotary tool, retaining all the elements of the hand tool, which change required no invention, and is a common manner of change or adaptation in this art or other arts. I might add that I find also in the hand tool a rand guide with a protecting lip covering the apex of the rand-cutting ridge or lip to protect the upper, precisely as in the Orcutt patent.

Int. 16. Please examine the cutter now shown you, marked "Defendants' Exhibit Colt's Armory Cutter," and state what elements you find therein, if any, which are in common with those shown in Orcutt's patent of 1881.

248 Ans. I find it to be a rotary cutter, the blades of which are each provided with a flat front face and a slightly eccentric outer or peripheral molded end, having formed thereon end ridges, substantially in the same manner shown in the Orcutt patent, the construction of the cutting blades being such that they may be ground off on their front faces without altering the form of the cutting bades. There is a backing off or clearance on each tooth precisely as in the Orcutt patent. The whole cutter is made as one solid piece, precisely like the Orcutt patent—that is the bed and end ridges of each tooth is made as a solid single piece with the body of the cutter. In fact, I find the said Colt's armory cutter to contain all the elements substantially like those described and shown in the Orcutt patent, saving differences in diameters and widths, which changes are immaterial and not substantial differences.

Int. 17. Do you or not think it would be beyond the scope of the

skill of an ordinary mechanic to form the front face of the cutting teeth of a rotary cutter embodying the essential features of the Brown patent at such an angle to a radial line as would produce the best result when cutting any of the various well-known materials which may be successfully operated on with such cutters? In answering this question please refer, if you wish, to any of the exhibits before you filed in this case or to any practical facts within your knowledge as a mechanic.

(Adjourned at 5.30 p. m.)

BOSTON, *April* 14, 1885.

Direct examination resumed:

Ans. I would say that to use rotary cutters for the purpose of cutting wood, leather, metals, and other materials has long been well known. According to the nature of the material, a certain angle of the cutting blade has in practice been found to be most serviceable for each, and any ordinary skilled mechanic, knowing the material to be cut and the configuration of the molded surface to be given to such material, is perfectly competent to make the desired angle to a radial line of the cutting face to meet the requisition. Brown invented a new departure in the art of making cutters, namely, a rotary cutter having the following combined features: Flat front faces on the cutting blades, a slightly eccentric outer periph-
249 eral molded end, the converse of the desired shape to be given to the material, with proper clearance back of the cutting surface, by which construction the cutter blades as they wore out could be sharpened on their front faces without altering the shape of the cutter blades. This feature of constructing a rotary cutter being well known, and the particular form of edge-trimmers as shown in the hand tool Exhibits "Snell & Atherton Cutters," "Snell & Atherton Cutter No. 2," "Bigelow Cutter," "Dunham Edge Cutter," and "Compl'ts' Exhibit Hand Plane," also being well known, it would be within the scope of the skill of any ordinary mechanic to give such a form as shown in said exhibts to a rotary cutter of the construction shown in the Brown patent. There would be no invention in giving to the front face of the cutter blade any particular angle to a radial line, for in the Brown patent it is shown as leaning back a little, while in the patent of Orcutt of 1879 it is shown undercut or hooking, and such front faces are similarly shown hooked or undercut in the Tayman patent of 1873, Molliere patent of 1855, and many others, and consequently it was no invention on the part of Orcutt, as stated in his patent of 1881, to make the front face of each cutting blade slightly hooking, as that was a well known form of construction on rotary cutters for cutting both metal, wood, and leather long before the date of Orcutt's patent of 1881.

Int. 18. Suppose you were told that it required inventive skill to shape a Brown cutter with the ridge marked "*b*" in Orcutt's patent of 1879 and numbered "1" in his patent of 1881, and as shown in "Complainants' Exhibit Busell Cutter (Orcutt pat. of '81)," sufficiently thin to enter the space between the top of the sole and upper of a shoe, notwithstanding the existence of the several earlier pat-

ents and cutters which are before you as exhibits in this case, what would be your opinion of such assertion? And give your reasons for such opinion as you may express.

Ans. I think such assertion is wrong, and wholly so, for the reason that any ordinary skilled mechanic could easily shape the Brown cutters according to any desired molded surface that was required. In making cutters for molding wood or similar soft materials, cutter blades often have to be made with sharp and pointed cutting edges, and a workman knowing the strength of the material of which the cutters are made could easily provide a cutter of the Brown
250 construction with any required sharp cutting ridges, if the desired form to be given to the article was known, without the exercise of any degree of inventive skill.

Int. 19. Taking Brown's cutter as shown and described in his patent, do you or not believe that it would be an invention to form a cutter embodying the essential features of Brown's patent and having a contour of its peripheral face unlike what had been before placed upon a Brown cutter, but which was an old and well-known form in the place or upon the article where such modified Brown cutter was intended to act?

Ans. I don't see how it could be any invention whatever in giving to the Brown cutter any particular well-known form. As I understand it, Mr. Brown did not patent any particular sectional form of his improved cutter, and under his patent he would, of course, have the right to make cutters for any purpose to which his invention might be adapted, and, consequently, the form of cutting blades, as shown in the Orcutt patent of 1881, being well known in the art on hand tools before Brown's patent, I can conceive of no inventive skill in merely giving an old and well-known transverse shape of the cutting blade to Brown's cutter; and I am, further, of the opinion that the Orcutt cutters, as described in his patent of 1881 and claimed therein, are an infringement on the Brown patent, as they have all the essential features of the Brown patent merely changed to a well-known cutting shape that Brown would have been entitled to have made by virtue of his patent and in view of the state of the art at the time.

Int. 20. Do you or not consider that it would require the exercise of inventive skill to shape a Brown cutter with a ridged, corrugated, or other molded configuration upon the peripheral face of its teeth, and having the end or plane next the ridge "1," as shown in Orcutt's patent of 1881, cut away or turned off sufficiently to leave the ridge "1," as shown in that patent, and so as to receive the circular rand disc or guard having a flat inner face, as shown in Figs. 3 and 4 of Orcutt's patent of 1879, and as shown in "Compl'ts' Exhibit Busell Cutter (Orcutt pat. of '81)?" In answering this question please refer, if you see fit, to the various rand discs or guards shown in the various exhibit patents before you, and to the Exhibit "Bigelow Cutter."

251 Ans. I don't consider that it requires any inventive skill, from the fact, as before stated, that Brown did not patent any particular form or configuration of the face of the cutters, and from

the fact that a thin protecting rand guard was well known in the art long before Orcutt's patent of 1881, as shown in the Exhibit "Bigelow Cutter," in the Bolling patent of 1877, in the Davis and Howe patent of 1874, in the Thompson patent of 1876, in the Knights patent of 1874, in the Tayman patent of 1873, in the Molliere patent of 1885, and many others. Therefore, as Brown did not patent any particular configuration of his cutter, and as both the configuration of the cutter shown in Orcutt's patent of 1881, as well as the combination of a rand guard with a rotary cutter was, well known previous to the said Orcutt patent of 1881, it required not a single atom of inventive skill to combine an old and well-known rand guard with a rotary cutter of the Brown construction.

Int. 21. Suppose that Orcutt's cutter is formed with sixteen teeth, as shown in "Compl'ts' Exhibit Busell Cutter (Orcutt pat. of '81)," and that in use the cutter makes seven thousand revolutions per minute, how many teeth will act upon the sole edge per second?

Ans. There will be one hundred and twelve thousand teeth act upon the sole edge in a minute, equal to eighteen hundred and sixty-six and two-thirds teeth per second.

Int. 22. Taking into consideration the actual resisting strength of the leather, the obtuseness of the angle between the front and top face of the teeth which produce the cutting edge, and the velocity and consequent force with which the teeth strike the leather, do you or not believe that the top or peripheral face of the teeth act as a guard to gage the depth of cut of the succeeding tooth?

Ans. I don't think it acts as a guard for the succeeding tooth. The velocity of the cutter makes it entirely impossible for any portion of the cutting blades to touch the leather except the front cutting face; and if a cutting tooth could be made strong enough, if it was only as thick as a sheet of paper, it would act equally as well as if it had a reduced backing behind it. To prove that the top of the teeth do not act as guards for the succeeding teeth, it is only necessary to press the sole edge continuously against the rotary cutter, when the whole of the sole may be cut away if the pressure is continued.

252 Int. 23. Admitting, for illustration, that the top of the teeth in Orcutt's cutter do act as a guard to gage the depth of cut, would they in your opinion, when the teeth were worn by grinding to a thickness equal to that shown in "Compl'ts' Exhibit Old Busell Cutter" or "Compl'ts' Exhibit Coté Cutter (Knights patent)," be any more effective as a guard to gage the depth of cut than would be the tops of the teeth in the exhibits just named; and state which, in your opinion, upon the theory above stated, would possess the most "guard," the exhibit already named or "Compl'ts' Exhibit Worn Cutters."

Ans. I say no; most certainly no. There cannot be any more guard in one case than in the other. It matters not how thick or thin the teeth are. If rotated they will continue to cut as long as the pressure of the cutter against the material to be cut, or *vice versa*, is continued—just like sawing wood with a circular saw. No portion of the teeth in any of the exhibits serve as a guard to gage the

depth of the cut, and to do this it would be necessary to have at the side of the cutters, or in some other way, a smooth gage to rest against the material operated upon when the cutters had reached the desired cut.

(Noon recess.)

Int. 24. Please examine the cutter now shown you, marked "Defendants' Exhibit Colt's Armory Cutter No. 4," and state how the end ridges thereon compare in point of thinness with the cutter shown in Orcutt's patent of 1881, and whether, in your opinion, such cutter, if older than the alleged Orcutt invention, would in any degree anticipate the same; and, if so, to what extent.

Ans. The end ridges in the "Colt's Armory Cutter No. 4" are, if anything, a little thinner than the ridge marked "1" in the Orcutt patent, coming almost, as you might say, to a knife edge, and are sharp enough to cut a piece of paper, as shown by the cuts now made by me with said cutter in the specification of the Bigelow patent, No. 88264. If older, the said Colt's Armory Cutter No. 4 would anticipate the Orcutt patent of 1881, in that it is a rotary cutter provided with flat front faces having their outer peripheral ends molded throughout to a uniform shape, the converse of the desired shape to be given to the material acted on and slightly eccentric to the axis of the cutter as described in claim one of the Orcutt patent of 1881;

253 also from the fact that it has cutting blades, of which each are provided with a flat front face and a slightly eccentric outer or peripheral end, having formed thereon end ridges extending circumferentially across said face, as described and set forth in claim two of said Orcutt patent; and I have every reason to believe that said cutters could be used to trim the edge of a sole of a boot or shoe equally as well as a cutter of the same diameter and width made in accordance with the Orcutt patent of 1881. I might also add that the teeth in the Colt's Armory Cutter No. 4 have their flat front faces of the blaces not radial, but are so inclined as to make each blade slightly hooking, precisely as described in the specification of the said Orcutt patent.

Int. 25. Please examine Defendants' Exhibits "Eppler Milled Bar," "Milled Iron Bar," and "Milled Composition Bolt" and state what, in your opinion, is the quality of the work performed thereon by milling-cutters, and state further, in this connection, whether or not you consider the cutters marked "Complainants' Exhibit Defendants' Cutters" practical milling-cutters for cutting metal.

Ans. I have examined the said three milled exhibits. The work is as sharp, smooth, and well done as could be done by means of any rotary milling tool usually employed in the art. If the cutters in question are made of steel and properly hardened I know that they are proper tools by means of which metals can be milled.

Int. 26. Please state whether or not you have had experience in working wood, leather, and metal; and, if so, please state whether there is any special difficulty in cutting, shaping, and forming leather with cutting tools, and whether any person with ordinary skill in working wood or metal could or not readily work leather

with cutting tools, either rotary or otherwise, to any desired form, and is or not leather frequently wrought or worked for use in connection with wood and iron manufactures.

Ans. I have, as a machinist and pattern-maker, worked on metals and wood. The former I have planed, drilled, turned, punched, milled, and filed, and the latter I have planed by hand machinery, sawed by hand, band saws, and circular saws, and turned. In my capacity as such workman I have had occasion also to work on leather for packings for pump-pistons, hydraulic and other packings, washers, leather beltings, straps for railway-carriage windows, and other articles, and I have found that leather has, as you
254 might say, no parallel grain tissues or fibres as are found in woods, and consequently I have found it much easier to work on leather, as compared with wood, from the fact that you can work leather equally well in almost every direction, whereas wood has to be worked somewhat different, according to the direction of the grain. Metals also I have found more difficult to operate upon than leather, particularly on account of their extreme solidity and hardness. I have found that leather can be operated on with almost any kind of a tool. It can be molded to almost any desired form under pressure; it can be cut, with sharp-edged tools, in slices, and it can be sawed in any direction equally well, and it can be grooved by rotary cutters of the proper sharpness almost independently of the angle of the front face to a radial line of the cutter, and, consequently, anybody acquainted with the art of operating on wood and metal would have no difficulty in operating in a similar manner or other manner on leather.

Int. 27. Please examine the cutter now shown you, marked "Defendants' Exhibit Stephenson Moulding Cutter," and state what elements, if any, you find therein which are in common with what are found in the Brown patent gear-cutter or the Orcutt patent of 1881. In answering this part of the question please omit the thin disc attached to the exhibit and afterwards state whether, in your opinion, with such disc applied the cutter would be practical or feasible for trimming shoe soles, and whether or not it in any respect constitutes or anticipates an Orcutt cutter when having such disc applied.

Ans. As compared with the Brown cutter, it has a series of cutting blades having flat front faces slightly eccentric on their outer periphery and molded throughout to a uniform shape with a proper backing back of the cutting edge. In comparison with the Orcutt patent of 1881 I find it to have a series of cutting blades which are provided with flat front faces and have their outer or peripheral ends molded throughout to a uniform shape, the converse of the desired shape to be given to the material to be cut, as set forth in the first claim of said patent. It also has, in addition to said features, end ridges extending circumferentially across said face, corresponding to the ridges "1," and "2," "2," as set forth in the second claim of said patent. It has, furthermore, a bed on
255 each cutting blade, a thin rand-cutting edge, and a bead; also a guard-cutter and a bead or sunk channel, substantially

in the same manner as shown and described in the Orcutt patent. In connection with the circular disc it has all the essential features of the rotary cutter and rand guard as shown and described in the said Orcutt patent, and as such it can successfully and practically be used for trimming the edges of boot and shoe soles.

(Defendants' counsel here puts in evidence the hand tool marked "Defendants' Exhibit Bigelow Cutter, E. H, spec'l exam'r;" also a copy marked "Defendants' Exhibit Bigelow Patent, E. H., spec'l exam'r.")

Adjourned to April 15, 1885, at 10 a. m.)

BOSTON, *April* 15, 1885.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 28. Are you aware of the practical results upon the art of sole-edge trimming which are due to the introduction of the Orcutt cutters?

(Objected to for the reason that the question assumes that the Orcutt cutter has effected "practical results upon the art of sole-edge trimming," which is an issue to be found upon all the testimony and not to be settled by any witness; and, further, defendants deny that the Orcutt cutter has affected the art any more than any other trimming cutter; and further, whatever effect it may have produced is due to the Brown invention and not to any invention of said Orcutt.)

Ans. I am not aware of any more practical results obtained by the use of the Orcutt cutter over and above a number of the exhibits about which I have testified.

Cross-int. 29. You see a guard which regulates depth of cut in all the hand-tool exhibits, do you not? I mean Exhibits "Dunham Edge Cutter," "Bigelow Cutter," "Hand Plane," "Hazard's Improved Dunham Edge Cutter," "Snell and Atherton Cutter," and "Snell and Atherton Cutter No. 2."

Ans. Now, to answer that question I want to quote a portion of the language of the Orcutt patent of 1881, in which occurs, commencing on the 94th line of the printed copy, as follows: "The main object of my invention is to provide a sole-edge cutter in which the depth of cut is the same as the height of the projection."

Now, if that feature for regulating the depth of cut is true in
256 regard to the Orcutt patent of 1881, I find precisely the same arrangement for regulating the depth of cut in all the hand-tool exhibits now shown to me. If, on the other hand, the depth of cut is regulated by a smooth plate located in close proximity to the rand-cutter, as shown in section line in Fig. 4 of the Orcutt patent, I find in the Defendants' Exhibit Bigelow Cutter precisely the same feature. I want, however, to say that such a feature is nowhere described in the specification or claims of the Orcutt patent and is not even lettered on the drawings. I refer to a smooth rand guard without any teeth upon the surface, and such a feature does not

form any part of the Orcutt patent, and was well known in the art in connection with rotary cutters long before the Orcutt patent.

Cross-int. 30. Don't you know that the quotation you made from the Orcutt patent relates wholly to the ridge "1," and not to the guard?

Ans. Well, now, really, after having read carefully the original specification, as well as the amended specification and claims of said Orcutt patent, I am somewhat both astonished and mystified as to what anything means in such documents from the fact that they are as different as chalk from cheese; but, even admitting that the language quoted from said patent relates to ridge "1," it is equally applicable to any portion of the cutting edge of the blade, as every portion of it is raked backwards to the same eccentricity, curvature, or inclination, and if the construction of said ridge serves as a guard to regulate depth of cut so does every other portion of the molded part of the cutting blade.

Cross-int. 31. Are you under the impression that the rand guide has anything to do with regulating the depth of cut of the cutter?

Ans. On a rotary cutter such portion of it that is smooth on its outer perphery adapted to come into contact with any portion of the article operated upon will serve for the purpose of limiting the amount of cut; and the rand guard, in addition to serving as a protector against injury to the upper, will also serve to regulate the depth of cut when its outer smooth edge reaches the bottom of the cavity between the upper and the top of the sole.

Cross-int. 32. Do you think that the rand-guard performs any such function in the practical use of rotary cutters for trimming sole edges?

257 Ans. Ordinarily it does not, for the operator guides the shoe by eyesight in relation to the cutter and in part by the outer inclined portion of rand-guard disc bearing againt the upper at or near its junction with the upper part of the sole.

Cross-int. 33. What are your reasons for considering the rand guide a portion of the cutter in your 31st answer?

Ans. I don't mean to say that it is a cutter or performs any function as a cutter, but it is one of the elements used in connection with a cutter, just the same as I might say that the rotary shaft to which the cutter is attached is a portion of the cutter.

Cross-int. 34. Now, please answer cross-int. 29, and observe that it does not relate at all to the Orcutt cutter, but simply inquires whether you see a guard to regulate the depth of cut in the hand tools?

Ans. I can't make my answer any more explicit than by saying that I find the same construction in said hand tools in regard to guard as shown and described in the Orcutt patent—precisely the same.

Cross-int. 35. In each of the hand-tool exhibits there is a molded portion which has no cutting edge, and this is what I call a guard to regulate the depth of the cut. Do you agree with me as to the presence of this element in all the hand-tool exhibits and that it does regulate the depth of cut?

Ans. If you do call that a guard. It is merely the receding rear portion of an unfinished front tooth, just the same as the receding rear portion of a cutting blade in the Orcutt patent of 1881 is below the cutting surface of the next tooth in the series. In some of the hand tools it may serve as a guard, although the depth of cut may be regulated by the inclination of the cutting tool to the article operated upon.

Cross-int 36. In which of the hand-tool exhibits do you think this element does not serve as a guard?

Ans. Particularly in these two (referring to Snell & Atherton cutter and Snell & Atherton cutter No. 2), and also in this one—Exhibit Bigelow Cutter—where there is an independent, smooth-edged rand-guard plate adapted to come in contact with the upper at or near its junction with the upper part of the sole.

Cross-int. 37. Do you not see that the guards on Exhibits
258 "Dunham Edge Cutter" and "Bigelow Cutter" are the same in all material respects, even to details of construction, whereby they may be adjusted to give more or less rankness of cut?

Ans. No; I don't see that, for in the "Dunham edge-cutter" the front piece can be adjusted even above the cutting edge of the blade, which cannot be done in the "Bigelow cutter," but only to a level surface with the cutter, and in the latter I think the depth of cut is regulated mainly by the independent, smooth rand-guard lip.

Cross-int. 38. What do you understand by rankness as applied to these hand tools and to rotary trimmers for sole edges?

Ans. A slightly eccentric, curved, inclined, or backward receding outer peripheral end of the cutting blade.

Cross-int. 39. In these tools—Exhibits "Dunham Edge Cutter," "Hand Plane," "Bigelow Cutter," and "Hazard's Improved Dunham Edge Cutter"—cannot the workman readily alter the degree of rankness to suit his taste or fancy?

Ans. What do you mean by the "degree of rankness."

Cross-int. 40. When the workman finds the chip or shaving too thick to suit him can he not alter either of the exhibits last named to make it cut a thinner chip or shaving, and when too thin can he not alter either of those tools to make them cut thicker by adjusting the guard in relation to the cutting edge of the blade in some of the exhibits and by adjusting the cutting edge of the blade in relation to the guard in the others?

I have put this question carefully and beg your careful attention to it, because I believe it relates to what is entirely clear and simple, and I have got the impression that you wholly misunderstand the matter.

Ans. He could alter the degree of cut by inclination of the cutting edge of the tool in relation to the work operated upon independent of any front piece, the same as a draw knife or heel shave is operated. He could do it in the manner you say or he could dispense entirely with what you call the guard—grinding the tool like a draw knife or heel shave.

Cross-int. 41. Don't you know that it is impossible for any man to use one of those hand tools without the guard for sole-edge trimming?

259 Ans. To prove that it can be done without the guard, I have cut a portion of the end marked by me now "A" on Exhibit "Corthell Experiment," by means of the "Defendants' Exhibit Bigelow Cutter," a hand tool, with its front piece, what you call a guard, detached. I have done the work upon a sole-leather piece, before the eyes of the counsel, to prove that it is not impossible for any man to use one of those hand tools without the guard for sole-edge trimming.

Cross-int. 42. Then you think it possible, do you, for those tools to be used without the guard for sole-edge trimming?

Ans. Most certainly, if there is only some rest behind.

Cross-int. 43. Do you know what will happen in practice when the tool is too rank? Please answer first as to the hand tools and second as to rotary tools. My question is limited to sole-edge trimming.

Ans. Well, a hand tool moving slow, as it usually is, must have the rankness or angle between the front cutting face and the outer surface very keen and sharp if a shaving is to be taken from the sole edge, and more blunt in a hand tool if the edge is scraped off. With a rotary tool going at a great speed the degree of rankness is not so important, if only the front of the cutting blades are properly sharpened.

Cross-int. 44. You have not answered the question, which is what you think will happen if the amount of material removed at each passage of the cutting edge be more than it should be. What I mean by rankness is the thickness removed by the cutting edge as it passes once over the sole edge. With this explanation I will restate the question as follows:

What do you think will happen in practice if the chip, shaving, or film removed be too thick? Please answer first as to the hand tools, then as to the rotary cutters, and bear in mind that I am not referring to the keenness or bluntness of the cutting edge, but to the amount of material removed at each passage of that edge, whether it be keen or blunt.

Ans. Well, I think what will happen is this: There will be a corresponding reduction of the sole. I can't see anything else that will happen, and I suppose that the proprietor of the shoe shop will get mad. In regard to rotary tools, the thing removed is always
260 in the form of powder or snuff; the amount removed is in accordance with the pressure towards the tool. I think the same thing would happen if the workman don't do his work properly.

Cross-int. 45. Suppose half the teeth were taken out of the Orcutt cutters, say, for example, the Exhibit "Busell Cutter (Orcutt patent of '81)," so as to leave the space between the remaining teeth considerably greater than it is, state how that would affect the rankness of the cutter, in your opinion. By rankness I mean, as before, the amount of material removed at each passage of a cutting edge.

Ans. I don't think it would affect it any at all, from the fact that in practice no less than one thousand eight hundred and sixty-six

of these teeth act upon the material every second during the rotation of the tool.

Cross-int. 46. The same question, supposing there was but one tooth in the place of every four in the exhibit referred to, the teeth left being of the same size as those of the exhibit?

Ans. Now, to answer that question it is essentially necessary to take into account the surface velocity of the cutting edges on the material. With about 7,000 revolutions in a minute, which is the practical speed, as I understand it, used in these cutters having sixteen teeth, making 1,866 teeth act on the material per second, should we remove one or more of such teeth from the cutters, it would only be necessary to increase the speed to get the desired number of teeth to act on the material in a given time, as has been found most useful in practice; and with the proper surface velocity of the cutter the work produced is entirely independent of the number of the teeth, their thickness, and the intervening spaces between them.

(Noon recess.)

Cross-int. 47. Are you now willing to admit that the last sentence in your 22d answer shows nothing more than what is self-evident, namely, that any depth may be cut, although such cutting edge may remove only a very small thickness of material at each action, and are you also willing to admit that what you say in that sentence does not even tend to prove that the tops of the teeth do not act as guards for the succeeding teeth?

Ans. Exactly. Any depth may be cut, "although each
261 cutting edge may remove only a very small thickness of material at each action." No; I am not willing to admit that the top of the teeth acts as guard for the succeeding teeth, and I think my reason is correct, as given in that answer. The only proper guard to limit the cut would be a non-cutting surface on one end of the cutting blade to rest on the material when a sufficient amount has been removed by the cutters. The intense speed by which the rotary cutter is kept in motion makes it entirely impossible that any portion of the cutting blades can rest or be brought in contact with the material, except the front cutting edges of such blades as they remove a portion of the sole edge.

Cross-int. 48. What do you think determines the amount of material which will be removed by a single passage of one cutting edge of rotary trimmers of the kind in controversy in this suit; for example, Exhibits "Busell Cutter (Orcutt pat. of '81)" and defendants' cutters?

Ans. That is very difficult to tell for the reason that, as the tool revolves 7,000 revolutions per minute, we cannot conceive of an interval of time so minute between the action of one cutter and the next one, for in its action the cutter is more like an abrasive material, such as glass, sand, or emery paper, and the particles removed are not in the form of slices, but more like powder or snuff, and therefore I think it is immaterial what inclination backwards is given to the teeth. It all depends upon the pressure.

Cross-int. 49. Do you think the Exhibit Bigelow Cutter is substan-

tially the same thing in construction, mode of operation, and result as the cutter marked Exhibit "Busell Cutter (Orcutt pat. of '81)" and defendants' cutters, or do you admit the two are substantially different in construction, mode of operation, and result? Please bear in mind that I ask you only what your opinion is and not your reasons for any opinion.

Ans. I don't want to give an answer so as to be confined to yes or no only, but will give it with proper explanations. In comparing a hand tool with a rotary tool we have to bear in mind that one, the hand tool, is moved very slowly as compared with the rotary tool, and for this reason the cutting edge in some hand tools like the one in question has a very sharp, knife-edge cutting blade;
262 otherwise they are substantially and precisely alike, even to the peculiar cross-section of the cutting blades. Both have a bed-cutting surface, with a rand-cutting edge, bead, and rand shield at one end, inclined guard cutter with sunken channel at the other, and, in fact, it looks as if the "Busell Cutter (Orcutt pat. of '81)" had been copied, even to the minutest details, from the essential elements in the Exhibit "Bigelow Cutter."

Cross-int. 50. Do you mean that you do consider the two things substantially the same in construction, mode of operation, and result?

Ans. Yes; bearing in mind that a hand tool cuts slow and slices the material, whereas the rotary tool cuts fast and powders the material.

Cross-int. 51. Are not these manifestly differences in mode of operation and in result?

Ans. No; because a rotary tool for trimming boot and shoe sole edges was well known long before the Orcutt cutters were made.

Cross-int. 52. What do you consider equivalents in the rotary tools, such as Exhibit "Busell Cutter (Orcutt pat. of '81)," for the guard or front piece in Exhibit "Bigelow Cutter?"

Ans. The rear, receding portion of the tooth preceding another in the Orcutt patent.

Cross-int. 53. Then you admit, I suppose, that there is this difference between the Bigelow and Orcutt cutters, namely, the first has but one cutting edge and one receding portion, while the latter has a number of cutting edges and a corresponding number of receding portions.

Ans. Yes; one is a multiplication and duplication of the other.

Cross-int. 54. You will also admit, will you not, that every receding portion in the Orcutt cutter is between two cutting edges, and that this is not so in the Bigelow cutter?

Ans. Every receding portion in the Orcutt cutters is not, strictly speaking, between two cutting edges, but between a space and a front cutting edge and after the space comes another tooth, precisely as shown in Exhibit "Snell and Atherton Cutter."

Cross-int. 55. What do you think in the Orcutt cutter is the equivalent for the body of the metal portion of Exhibit Bigelow Cutter and for what Bigelow calls "the ear-shaped throat?"

263 Ans. The body portion and a part of the guard-cutter in the Orcutt cutter. The throat has its equivalent in the downward projecting side spaces in the Orcutt cutter.

Cross-int. 56. What in the Orcutt cutter for the tang and for the handle in the Bigelow cutter?

Ans. As the one is a hand tool and the other a machine tool—one adapted to be held in the hand and the other to be fastened to a rotary shaft—I suppose you might strictly say that the tang and handle of the hand tool are equivalents for the central body of the rotary tool, and that a rotary shaft, to which the rotary cutter is attached, is equivalent to a man's hand and arm by which the handle of the hand tool is operated.

Cross-int. 57. Do you think that the tool shown in patent No. 157,476, to James C. Knights, is substantially the same in construction, mode of operation, and result as the Orcutt cutter? Please answer as briefly as possible, as all I want to know is whether you are willing to swear they are the same in substance, so far as concerns construction, mode of operation, and result, and it is wholly immaterial at present why you think as you do.

Ans. Shall I say yes or no or shall I say what I think is like and unlike in those tools?

Cross-int. 58. All I care to know at present is whether you think the two are substantially alike in construction, mode of operation, and result. If you think there is no substantial difference between them in construction, mode of operation, and result it seems to me you should answer yes in substance. On the other hand, if you think they are substantially the same in construction, but substantially different in mode of operation or result, you can say that. In brief, say what you think, but please don't say why you think so.

Ans. Yes; they are substantially alike in construction, mode of operation, and result. The only difference is in the transverse shape of the molding cutting-blades, the Knights showing a convex or curved outer surface, whereas the Orcutt patent shows a transverse cutting surface of the blades precisely like that shown in Defendants' Exhibit Bigelow Cutter. A hand tool and such configuration of the cutting-blade is immaterial and not substantial.

Cross-int. 59. Please answer the same question as to "Thompson rand and sole edge trimmer."

264 Ans. The same answer applies to this as to the other; and, in addition to the Knights patent, I find here rand-cutting knives with beads and guard-cutters for the same purpose and as equivalents of the ridges "1" and "2" in the Orcutt patent.

Cross-int. 60. Please answer the same question as to the tool shown in patent No. 188,337, to Busell.

Ans. Yes.

Cross-int. 61. Please answer the same question as to the tool shown in the Tayman patent, No. 136,790, reissue No. 9073.

Ans. Yes.

Cross-int. 62. Do you know why the sole-edge trimmers used on Exhibits "Eppler Milled Bar," "Milled Composition Bolt," and "Milled Iron Bar" were sunk into a surface wider than the extreme

width of the cutters and not used upon the edge of a piece of metal of the same width as the sole edge for which those cutters were adapted?

Ans. Well, I suppose it was to show that even the very thin projecting ridges of the teeth were strong enough to cut metal without breaking, and that, in fact, such cutters were nothing more or less than ordinary cutters, as made under the Brown patent.

Cross-int. 63. Do you think Exhibit "Stephenson Moulding Cutter" substantially the same in construction, mode of operation, and result as the Orcutt cutter?

Ans. Precisely the same.

ALBAN ANDRÉN.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Francis J. Howell.

BOSTON *April* 21, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Francis J. Howell; 24; Boston; book-keeper at present, but was a machinist from 1877 to 1884.

265 Int. 2. Please state whether, in your occupation as machinist, you had occasion to be familiar with the use of milling tools.

Ans. I had.

Int. 3. Please examine the cutter now shown you, marked "Defendants' Exhibit Howell Cutter," and the bar of iron marked "Defendants' Exhibit Howell Milled Iron Bar," and the composition casting marked "Defendants' Exhibit Howell Milled Composition Casting," and state whether you have seen them before; and, if so, for what purpose, and what, if anything, you did with them.

Ans. I have, and milled them myself with the cutter referred to.

Int. 4. Please state the number of revolutions per minute at which the cutter was driven when milling the iron bar, and also when milling the composition casting.

Ans. The cutter in milling the iron bar was driven 110 revolutions per minute, and in milling the composition casting 170 revolutions.

Int. 5. Please state how these speeds compare with the usual speed of milling cutters in milling like materials.

Ans. In milling the iron I would say we run from the same speed to 40 revolutions less per minute; the composition was about the usual speed.

Int. 6. What was the feeding or advancing movement of these two exhibits when being milled?

Ans. That of the iron was automatic feed and occupied three minutes in milling the exhibit. The composition casting was fed by hand and occupied one minute.

Int. 7. How do these rates of feeding compare with the usual feed motion in milling similar material?

Ans. That used on the iron was about the ordinary rate; that on the composition was about one-third faster than would ordinarily be used.

Int. 8. Which, in your opinion, is the severer test upon a milling tool like the Exhibit Howell Cutter, to mill a bar of iron of the same thickness as the milling face of the cutter like Exhibits Howell Milled Iron Bar and Howell Milled Composition Casting, or to mill a channel through the body of the metal like that in Defendants' Exhibit Eppler Milled Bar?

266 Ans. That of the Eppler milled bar.

Int. 9. How many cuts did you make on the two exhibits milled by you?

Ans. One cut on each.

Int. 10. What, in your opinion, is the quality of the work performed by the cutter in the two exhibits milled by you?

Ans. As good as I ever saw, as smooth as any piece of milling work I ever did.

Int. 11. What, in your opinion, is the quality or capacity of execution, as a metal milling-cutter, of the Exhibit Howell Cutter as compared with other milling-cutters with which you are familiar?

Ans. Well, it is equal to ordinary cutters—in fact, any cutters—that we use on milling machines, both as to quality and capacity of execution, in so far as I have tested it.

FRANCIS J. HOWELL.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Willie C. Young.

BOSTON, *April* 21, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Willie C. Young; 37; Worcester, Mass.; machine-tool builder.

Int. 2. Do you carry on the machine business on your own account; and, if so, how long have you carried on the business?

Ans. Yes. Since February, 1877.

Int. 3. Did you know C. P. Bigelow, the patentee named in United States patent No. 88264, issued March 30, 1869; and, if so, is he now living or dead, and did you make a contract with him to manufacture and sell his cutter, under a license, for a royalty? If you did, please give the date of the license, and state what you did under the same.

Ans. I knew him; he is dead. I made a contract with him to manufacture and sell his cutter, signed August 3, 1877. I
267 fitted up tools to manufacture them, and have continued to the present time. In 1878 I sold 237; in 1879, sold 531; in

1880, sold 979; in 1881, sold 1,080; in 1882, sold 853; in 1883, sold 432; in 1884, sold 206; this year, do not know how many. Since the increase of my other business I have not given so much attention to the manufacture and sale of cutters; have had no one out soliciting orders for them since 1882.

Int. 4. Please state whether or not these cutters are made "rights" and "lefts"—that is, with the rand lip and rand guide and the guard reversed, or on the opposite sides from that shown in the Exhibit "Bigelow Cutter," now shown you.

Ans. Yes; they are made as parties order them. A left-handed man has a left-handed plane.

Int. 5. Do you know anything of Bigelow's having made a rotary cutter having a series of cutting blades in it? If so, please state what you know about it and how it was made.

Ans. Yes; he showed me one in 1877. It consisted of two discs, one having a hub that projected through a hole in the other one. The hub had a thread cut on it with a nut on it for drawing the two discs together. It was some three or four inches in diameter, and had five or six of the blades used in his plane fastened into it between the flanges by means of the nut.

Int. 6. Do you know where that cutter now is, and have you made any search or inquiry about it? And, if so, please state what you learned or was informed in regard to it.

Ans. I don't know where it is. I inquired of the widow and son of Mr. Bigelow for it, and they told me it was probably sold along with other stuff that was around the house after the death of Mr. Bigelow.

Int. 7. Have you in the course of your business had occasion to cut sole leather? And, if so, state whether you regard it as easy or difficult to work by an ordinary mechanic, a worker in wood and metal.

Ans. Yes; I have had occasion to work sole leather, in testing my edge planes, and in facing pulleys and emery wheels. I never found any difficulty in working it myself, and I never found any machinist who was not capable of getting a good surface on it.

268 Int. 8. Please examine the rotary cutters now shown you, marked respectively "Brown and Sharpe Milling Cutter No. 1," "Brown and Sharpe Milling Cutter No. 2," and "Busell cutter (Orcutt pat. of '81)," and state whether you believe the Brown and Sharpe Exhibit Cutters capable of performing good work in trimming or molding the edges of sole leather, and whether you believe there would be any practical difference in the work performed by those cutters and that performed by the Exhibit "Busell Cutter (Orcutt pat. of '81)."

Ans. I think that if the Brown & Sharpe cutters are run at the same surface speed as the other they are capable of performing as good work.

Int. 9. Please state whether, in your opinion, the cutter now shown you, marked "Defendants' Exhibit Young Cutter, E. H., spec'l exam'r," is or is not a properly constructed cutter for milling metals?

In answering this question, please present any exhibit which you may have as illustrating your idea.

Ans. Yes; I think it is properly constructed for milling metals, and I have milled a piece of metal with it which I have here, at the same speed and feed as that used with cutters bought of E. E. Garvin & Co., of New York, which are of similar construction to the Brown and Sharpe cutters.

(The cutter referred to and the milled bar, marked "Defendants' Exhibit Young's Milled Iron Bar, E. H., spec'l exam'r," now offered in evidence.)

Int. 10. What is the quality of the work performed in milling the exhibit bar?

Ans. It is as good as any work that can be done on the machine it was done on, which is of light construction. The piece broken out of the milled bar was broken in fastening it into the chuck for milling the other side.

Int. 11. What, if any, difficulties would there be in milling metal with the cutter now shown you, marked "Busell cutter (Orcutt pat. of '81)?"

Ans. I should say that the base of the teeth have too little metal to give smooth work; also that they are slotted so deep that the cutter would have a tendency to chatter.

Int. 12. Take the cutting portion of the front face of the
269 teeth in these cutters marked "Busell cutter (Orcutt pat. of '81)," and are they practically hooking to any extent or not?

Ans. I should think they were not. I should say positively they were not.

Int. 13. What do you believe to be the object of undercutting the lower portion of the teeth in these cutters on the front side?

Ans. Well, I should suppose it was done to facilitate grinding; I don't see any other object in it.

Int. 14. Which do you believe would subject these cutters to the severest strain, to mill their peripheral configuration in a bar of metal exactly as thick as their milling face or to cut that line in the body of metal thicker than their face, like "Defendants' Exhibit Milled Composition Bolt," "Defendants' Exhibit Eppler Milled Bar," "Defendants' Exhibit Milled Iron Bar," and "Defendants' Exhibit Young's Milled Iron Bar?" And give your reasons for your opinion.

Ans. They would be subjected to the greatest strain in cuts such as are shown in these exhibits, from the fact that the outside edges of the cutters, having no clearance, will strain the cutters more in the cuts shown than they would in cuts where the outside did not come in contact with the metal.

Int. 15. Please state what, in your opinion, is the quality of the work performed on the three first exhibits mentioned in the preceding question.

Ans. I should say all the cuts except the cut marked "No. 1," on the composition bolt, was first-class work.

WILLIE C. YOUNG.

Attest: EUGENE HUMPHREY, *Special Examiner.*

Deposition of Riley Pebbles.

BOSTON, *April* 24, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Riley Pebbles; 62; Natick; boot and shoe manufacturer.

Int. 2. Please state how long you have been engaged in you present business.

270 Ans. Thirty-three years.

Int. 3. Have you used in your business rotary sole-edge trimming machines; and, if so, for how long a time, as near as you can state?

Ans. I have; from five to six years.

Int. 4. What kind of rotary cutters have you used and do you now use upon these machines?

Ans. The Busell cutter, with blades set in a hub, like this one I hold in my hand (Exhibit "Complainants' Exhibit Old Busell Cutter.)"

Int. 5. Have you had other cutters tested or tried by your workmen for trimming sole edges; and, if so, with what results?

Ans. Yes; I have; not satisfactory so as to adapt them. The cutters were solid and milled out like or similar to this (referring to "Defendants' Exhibit Young Cutter.")

Int. 6. Do you have the cutters that you use rebladed when worn out or do you purchase new cutters?

Ans. We exchange them for either new ones or old hubs rebladed.

Int. 7. What price do you pay in exchange for either new ones or old hubs rebladed?

Ans. One dollar per cutter.

Int. 8. Do you employ a cutter with the edge-trimming cutter so as to take out the rand or welt at the top of the sole?

Ans. We do.

Int. 9. Is or not the quality of trimming which you obtain with these insertable tooth-cutters satisfactory?

Ans. It is.

Int. 10. Please state whether you have tried cutters like the Busell cutter ("Orcutt pat. of '81") more than once; and, if so, how many times.

Ans. We have tried them at two different times. After we tried it the first time and it was a failure they claimed they had got something a little different.

Int. 11. How many machines do you run in your factory for trimming soles when working in full force?

Ans. We have four machines, but only run all four when pressed.

RILEY PEBBLES.

Attest: EUGENE HUMPHREY,
Special Examiner.

271 *Deposition of Oscar E. Draper.*

BOSTON, *April* 24, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Oscar E. Draper; 35; Framingham; salesman for the Clinching Screw Company.

Int. 2. Have you heretofore had experience in trimming boot and shoe sole edges with rotary trimmers; and, if so, when did you first commence using such trimmers?

Ans. I have. I first commenced using such trimmers about eleven years ago.

Int. 3. What kind of rotary cutters did you first use?

Ans. That is the cutter I first used.

(Witness selects and refers to exhibit marked "Compl'ts' Exhibit Coté Cutter (Knights' pat.).")

Int. 4. Where did you first use these cutters and what was the quality of work performed by them.

Ans. It was in E. Mann & Sons' factory, at Milford, Mass. They did good work.

Int. 5. Where did you next use them?

Ans. At Charles E. Johnson's, at Natick.

Int. 6. Where next did you use them?

Ans. At James Tucker & Company's, at Wellesley, Mass.

Int. 7. In how many places in all did you use these cutters before 1877, as near as you can recollect?

Ans. In addition to those named I used them at L. M. & D. H. Nute's, Great Falls, New Hampshire; Alonzo Nute & Son's, at Farmington, N. H.; E. & A. H. Batcheller & Co., North Brookfield, Mass.; W. F. Trowbridge, of Hudson. That is all I can call to mind now.

Int. 8. How many machines using this kind of cutters did Batcheller have on or before 1877?

Ans. Fifteen.

Int. 9. Please state the circumstances, if you know, under which these machines were introduced into Batcheller's factory.

Ans. Well, the circumstances were these: I was working for D. Whittemore, selling machinery. I called on Mr. Batcheller
272 and asked him if he had seen any of the edge-trimming machinery. He asked me if I knew anything about the machine and could run it. I told him that I could, and he showed me some of his goods and asked if I could do as good work with the machine as there was on his goods, which were hand-trimmed. I told him I could do better. He then told me to ship a trimmer and an edge-setter to North Brookfied, set them up, and go to work, and he would be there the next Friday and see the work. I did so. I set the machine up and went to work. Mr. Batcheller came the next Friday

afternoon and I trimmed all kinds of the boots and shoes that they were making at that time to his perfect satisfaction, and received from him that day an order for fifteen sets of machines. In showing the machine off to Mr. Batcheller as to speed I trimmed sixty pairs of brogans in eight minutes, as he informed me, having held the watch. He was perfectly satisfied with the quality of the work, and in about one month after Mr. Batcheller hired me to take charge of his trimming, heeling, and edge-setting machinery and work, and I remained with him five years.

Int. 10. Please state the sum for which such machinery was then selling per "set."

Ans. It was selling for five hundred dollars for a trimmer and a setter, which constituted a set.

Int. 11. What saving, if any, was effected by the introduction of machine trimming with cutters like "Compl'ts' Exhibit Coté Cutter (Knights' pat.)" over the former method of hand trimming?

Ans. About two cents per pair.

Int. 12. How many pairs of boots and shoes was Batcheller making per day during the time you worked for him?

Ans. Anywhere from six thousand to ten thousand pairs per day.

Int. 13. Was any change made in the kind of cutters used while you were at Batcheller's; and, if so, how soon after you went there?

Ans. In the neighborhood of a year after I went there we changed the old Coté machines for the Busell trimmer, which had cutters like "Complainants' Exhibit Old Busell Cutter." The object of the change was to get the welt knife to clean out the welt. There was no fault with the edge finish done by the Coté machine, but the cutters had no welt knife and we had to take it out by hand.

Int. 14. Did or not the old Busell cutter take out the rand or welt in a satisfactory manner?

273 Ans. Well, it did after we had some change in the beating out of the soles, so as to give room for the knife to work.

Int. 15. Were or not the old Busell cutters used by you as long as you were at Batcheller's?

Ans. They were.

Int. 16. Have you ever seen any other cutter except those having the rand-cutter inserted like the old Busell cutter that would take out the whole of the rand or welt at the same time that the sole was being trimmed?

Ans. I never have, that worked successfully.

Int. 17. What is the usual method of cutting out the rand when trimming sole edges with cutters like "Compl'ts' Exhibit Busell Cutter (Orcutt pat. of '81)?"

Ans. The usual plan is either to have the rand-cutter rotate on an independent shaft or to take it out with a hand tool.

Int. 18. Please examine the shoe now shown you, marked "Defendants' Exhibit Corthell Shoe No. 12," and state whether or not the right-hand portion of the sole represents a shoe sole as prepared for being trimmed with rotary cutters like "Compl'ts' Exhibit Busell Cutter (Orcutt pat. of '81)."

Ans. Yes, sir; I should say that it does.

Int. 19. At the time when you commenced your efforts to introduce machinery for trimming sole edges were manufacturers ready to receive such machinery, or was it a work of difficulty to induce them to adopt such machines?

Ans. I think it was a very easy job to get them to take them. All they wanted was to see the machine work successfully and they were ready to take hold.

Int. 20. How many trimming machines, as near as you can state, do you think you introduced before going to work for Batcheller?

Ans. As near as I can remember, from twenty to twenty-five. I was only selling the machines for two or three months before going to work for Batcheller.

Int. 21. Please state what are the relative numbers of shoes that can be trimmed per day or per hour by the "old Busell cutter" or by cutters like "Compl'ts' Exhibit Busell Cutter (Orcutt pat. of '81." Give your best judgment, based upon your experience.

274 Ans. It is my opinion it is a great deal more with the man than it is with the cutter. While in North Brookfield I taught about twenty-five men to run trimming machines. Some of them could trim a hundred pairs an hour any time they were asked to; others couldn't trim fifty. I think that the old Busell cutter is capable of doing about a third more work than any other cutter that I have seen in use since that was got out.

Int. 22. Are you familiar with the use and working of cutters like "Compl'ts' Exhibit Busell Cutter (Orcutt pat. of '81)?"

Ans. Yes, sir.

Int. 23. Please examine the boot now shown you, marked "Defendants' Exhibit Mitchell Boot," and state what, in your opinion, is the quality of the finish of the sole edge.

Ans. I consider it a very fine edge, indeed—a great deal better than you will find on almost any one's goods manufactured in Massachusetts.

Int. 24. Please state whether or not it would be practical to trim sole edges like the "Mitchell boot" with cutters like that now shown you, marked both Defendants' and Complainants' "Exhibit Rounds' Rand and Edge Cutter."

Ans. I don't see why if a closely fitted boot, well fitted, it would not be practical to trim it with this cutter.

Int. 25. Have you heretofore worked for Messrs. Claflin, Coburn & Co., boot and shoe manufacturers; and, if so, when did you begin with them and when did you leave?

Ans. I began the first day of December, 1882, and left the first of August, 1884; had charge of their bottoming department in their South Framingham factory.

Int. 26. What kind of rotary cutters for trimming shoe-sole edges were used in their factory; and, if more than one kind was used, what proportion of each?

Ans. The Busell cutter—this one (referring to "Compl'ts' Exhibit Old Busell Cutter")—was used on about three-quarters of their work. The balance was trimmed with a rotary plane.

Int. 27. From your knowledge and experience in shoe-sole trimming with different cutters do you think the number of shoe soles now trimmed yearly with rotary cutters has been increased by the introduction of cutters like "Complainants' Exhibit Busell
275 Cutter (Orcutt pat. of '81)" over and above what would have been so trimmed had the "old Busell cutter" remained the only cutter in use?

Ans. No, sir; I don't think it has.

Int. 28. Please state the amount of business done and number of hands employed at Claflin, Coburn and Co.'s factory while you were there.

Ans. I can't give the exact number of hands, but they manufactured, in the busiest part of the season, from 150 to 200 twelve-pair cases per day.

Int. 29. Please examine the block of leather now shown you and state what, in your opinion, is the quality of the molding that has been performed on the edges thereof.

Ans. I should consider it quite smooth work, although the leather has shrunk out of shape some since it was done.

(Defendants' counsel here puts the block of leather referred to in evidence, marked "Defendants' Exhibit Draper Molded Leather, E. H., spec'l exam'n'r.")

OSCAR E. DRAPER.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Charles H. Brown.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

BOSTON, *April* 25, 1885.

Int. 1. What is your name, age, residence, and occupation?

Ans. Charles H. Brown; 42; Boston; machinist.

Int. 2. How long have you worked at the machine business?

Ans. Twenty-two years.

Int. 3. Have you made any experiments in milling metal with rotary cutters in order to test their capacity for the purpose of proof in this case? If so, please describe the same, using as exhibits any tools or milled work which you may have.

Ans. I have. With this cutter I milled the short slot or groove in the steel bar here shown. After commencing this short groove the arbor of the milling machine worked loose, drew out and
276 allowed the cutter to work towards the side of the bar, and making the groove crooked, and thereby breaking off the thin ridges from nine of the teeth in the cutter. I then readjusted the machine, reversed the bar, and milled the long groove at its opposite edge with the same cutter in the condition in which it now is. (The bar and cutter referred to are now introduced in evidence and respectively marked "Defendants' Exhibit C. H. Brown's Milling Cutter" and "Defendants' Exhibit C. H. Brown's Milled Steel

Bar.") I then milled the edge of the same bar with this other cutter, the milling being about half the length of the bar. (The cutter referred to here introduced in evidence and marked "Defendants' Exhibit C. H. Brown's Milling Cutter No. 2.")

Int. 4. What is the grade, quality, and manufacture of this Exhibit Steel Bar milled by you?

Ans. It is Jessop's (English) warranted tool steel, and is regarded as being the best tool steel we can get.

Int. 5. Of what material is the rotary cutter made with which you milled the long and short grooves on the flat side of the steel bar?

Ans. Of Jessop's best tool steel, the same as the bar.

Int. 6. What is the character or quality of the metal of which the cutter is made with which you milled the edge of the steel bar?

Ans. Bessemer steel.

Int. 7. How many cuts did you make in milling the grooves in the flat side of the Exhibit Steel Bar, and how many cuts in milling the edge thereof?

Ans. One cut each on the grooves in the flat side and two cuts on the edge, the last very light, a finishing cut, which stops short of the first cut and shows its depth, which is very much less than $\frac{1}{100}$ of an inch.

Int. 8. What was the feeding speed of the milling machine when milling this bar, or how long time did it take to mill the longest groove?

Ans. Twenty minutes, which is a trifle over an inch in two minutes.

Int. 9. What was the rotary speed of the cutter?

Ans. About one hundred and ten revolutions, which is at the rate of about fifty-five feet per minute.

Int. 10. How does this speed compare with the proper speed for milling-cutters of the diameters of your exhibits?

Ans. It is about twice the speed it ought to be.

277 Int. 11. Why did you then run it at such speed?

Ans. I have no way of reducing it and making it run slower. I run the miller on its lowest speed that it was belted to run.

Int. 12. How many kinds of steel are recognized in a general way by machinists? This question does not refer to the different manufactures, but to the general classes into which steel is divided.

Ans. "Tool," "machinery," and "Bessemer" steels.

Int. 13. Which is the better quality, which the second, and which the poorest?

Ans. "Tool steel" or "cast steel," so called, is the best, "machinery" steel the second best, and "Bessemer" the poorest grade.

Int. 14. Will or not "tool" and "machinery" steel both harden by the mere heating and immersing in cold water?

Ans. Yes.

Int. 15. Can Bessemer steel be hardened except by the employment of chemicals?

Ans. I should say no.

Int. 16. Did you experience any difficulty in milling the steel bar

with these cutters, except in the matter of the working loose of the arbor, as already stated?

Ans. Not any.

Int. 17. Would there be, in your opinion, any reason for breaking or any danger of breaking the cutters, provided all parts of the machine operated as it was set to operate?

Ans. Not any.

Int. 18. How would the feeding speed of the steel bar, as stated by you, while you were milling it compare with the usual and ordinary speed of similar milling work?

Ans. About one speed faster—that is, one-third faster.

CHARLES H. BROWN.

Attest: EUGENE HUMPHREY,
Special Examiner.

278 *Deposition of Henry Cunningham.*

BOSTON, *April* 27, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

(It is agreed that the following affidavit is part of the direct testimony of the witness:)

"I, Henry Cunningham, of Boston, and one of the firm of F. M. Stevens & Co., being duly sworn, do on oath depose and say that my age is forty-three years. I have been a member of said firm since about January, 1881.

"I have before me and have read the affidavit given by said Stevens to be used in this suit, and I was present when O. L. Noble was urging our firm, late in 1882, to quit making rotary cutters for the Corthell Company and contract to make cutters for the Busell Company, of which said Noble was then, as now, superintendent; and, in addition to increased compensation promised us by him, he strongly urged that our leaving the Corthell Company would force them to compromise the then pending suit between said companies on the Orcut patent and lead to a consolidation of the two companies, which, he urged, was the best course, because, as he often stated, the trial of that suit would make the Orcutt cutter public property. The statement made in connection with this suit by said Noble—that the Busell Company made advances to our firm while we were making cutters for said company—is false in fact and an attempt to impose on the court, because said company failed to give us the amount of work agreed upon by the sum of $5,000; and if they had given us the amount of work that they agreed to we should have received from them more money than we received of them, including the advances; and when the advances were made Noble stated that he made them because he was under obligations to us so to do under our contract with said company.

"At the time of the consolidation of the Busell and Corthell Companies it was generally urged by both sides that it was better to

consolidate than make the cutters common property, as the trial of the suit would certainly do; and although the Corthell stockholders regarded the terms as unequal, oppressive, and unjust, yet they accepted them as the best they could obtain, and especially
279 as they were at great disadvantage by reason of Noble's having hired and taken away our facilities for making the Corthell Company cutters.

"When Noble was about bringing the suit at law against us, the present year, which I am informed has not been entered, he stated in my hearing that he would resort to every mean, dirty trick that he could to break up our business unless we would agree to quit making cutters."

Int. 2. What is the present price at which the cutters in controversy are sold by you and the complainants?

Ans. One dollar each by us; I suppose the same by them.

Int. 3. Have you seen circulars issued by the complainant company, or purporting to be, stating that the price of cutters during the pendency of this suit will be one dollar each?

Ans. I have.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 4. What was the price per cutter paid you by the Busell Company when you made cutters for them?

Ans. One dollar each.

HENRY CUNNINGHAM.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Samuel N. Corthell.

BOSTON, *April* 24, 1885.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Are you one of the defendants and have you heretofore testified in this case?

Ans. I am and I have.

Int. 2. Please examine the exhibit now shown you, marked "Defendants' Exhibit Draper Molded Leather," and state, if you know, with what exhibit cutters, if any, the respective edges were molded and by whom.

280 Ans. One edge was trimmed with "Compl'ts' Exhibit Brown and Sharpe Milling Cutter No. 2" and the other edge with "Complainants' Exhibit Brown and Sharpe Cutter No. 1," by myself.

Int. 3. Please state how these cutters performed their work—whether it was any more difficult to trim with them than with ordinary trimming-cutters, and what is the quality of the work respectively performed by them.

Ans. The cutters mentioned run as smoothly and cut as well as any of the cutters that I have trimmed with, and the quality of the work that they performed is as smooth, fine, and nice as any of the molded planes would trim the same thickness; but, the leather being damp, it don't show as well now as it did at the time it was trimmed, on account of the checking.

Int. 4. You spoke of the dampness of this exhibit when being trimmed. Was it any more damp than shoe soles generally are when being trimmed?

Ans. No; it was not; but where there are so many pieces of leather nailed together, not being pressed as a heel is nailed onto a shoe, there will be more liability of checking than where there is only two or three pieces.

Int. 5. What is the effect upon a shoe sole, after being trimmed, to lay in the open air for a length of time before being finished and set?

Ans. My experience has been that shoe edges left, after being trimmed, in the open air for a time before being finished will check. The fibre of the leather will rough up and look coarse, as if trimmed with a dull cutter. I have had well-trimmed edges that were smooth and fine when they came from the trimming machine, after laying over from a Saturday till the next Monday, check and rough up so that I was obliged to dampen them with a sponge and trim them over lightly before I could procure a satisfactory — by setting it.

Int. 6. Please examine the piece of black walnut now shown you, marked "Defendants' Exhibit Corthell Molded Board, E. H., spec'l exam'r," and state whether the same was molded by you or in your presence and with what cutter, if you know.

Ans. This black walnut board was molded by myself with the
"Defendants' Exhibits Corthell Cutters" Nos. 1, 2, and 3,
281 "Defendants' Exhibit Stephenson Cutter No. 3," and the
"Defendants' Exhibit Corthell Miter Cutter." One path was cut by each cutter, and one cutter cut two of the paths.

(The Exhibit Board and Miter Cutter now put in evidence.)

Int. 7. Do you know anything about cutters having at any time been made similar to the Exhibit "Old Busell Cutter," but formed of a single piece of metal, by milling the slots between the teeth? If so, state, if you know, by whom made and by whom used, and by what name or designation they are known in the market.

Ans. I do. They have been made by the Busell Trimmer Company, at the request of E. & A. H. Batcheller & Co.'s foreman, and used by them, and were called "the Batcheller cutter," both by the Busell agents and the operators using them. One convex cutter of this style was marked "style 108."

Int. 8. Have or not these cutters been made by the defendants, and are they or not making them at the present time?

Ans. They have been and they are now.

Int. 9. How are those cutters secured upon the arbor?

Ans. There is a thread cut in the hub which allows them to be

screwed onto the arbor and used in place of the Exhibit "Old Busell Cutter."

Int. 10. Please state whether you were present when the sole edge of "Defendants' Exhibit Thompson Shoe No. 2" was trimmed; if so, with what it was trimmed.

Ans. I was. It was trimmed with "Defendants' Exhibit Stephenson Molding Cutter."

Int. 11. What was the operation of that cutter for that purpose—that is, how did it perform its work—good, bad, or indifferent?

Ans. It trimmed a very fair, smooth edge, as good as the average on that class of work. I blacked and set the edge on the shoe referred to in order to preserve its form.

(Adjourned to Monday, April 27, 1885, at 10 a. m.)

MONDAY, *April* 27, 1885.

(Direct examination resumed:)

Int. 12. Please examine the price-list now shown you, marked "Defendants' Exhibit Complainants' Catalogue, W. A. C.,
282 spec'l exam'r" (now put in evidence), and state whether it is one of the latest edition issued by the complainant company.

Ans. It is, as far as I know. I have never seen one later. This is dated October 1, 1883.

Int. 13. Please state whether heretofore the complainant company had been in the habit of marking upon the machines sold by it a list of patents like that shown on page 32 of said catalogue.

Ans. I should say they had. I never have seen any of their machines but that had a list of patents marked thereon reaching nearly the length of the column of the old style of machine, and on one corner of the base of the new machine, of which a cut is shown on the first leaf of said catalogue.

Int. 14. Have you with you samples of a cutter known as the "108" or the "Batcheller" cutter? If so, will you please introduce them and have them marked as exhibits in this case?

Ans. I have a cutter in my hand marked by stamping in the slot "No. 36, S. 108," and on the other side "Pat. March 4, 1879." This is the cutter known as the "Batcheller" cutter. (Cutter referred to put in evidence and marked "Defendants' Exhibit Complainants' Batcheller Cutter No. 108, E. H., spec'l ex'r.") I have now in my hand another cutter marked in the slot "36, S. 108," and on the other side "F. M. S. & Co.," which was made by the defendants in this case, and is also known as the "Batcheller" cutter. (The cutter last referred to now put in evidence and marked "Defendants' Exhibit Defendants' Batcheller Cutter, E. H., spec'l exam'r.")

Int. 15. By whom, if any, are these cutters used, and how long, to your knowledge, have they been in use?

Ans. They are used by E. & A. H. Batcheller, at North Brookfield; Moses Walker, of Milford. These are all the places I have seen them in use. Other parties have purchased them. They have been in use the past year—for about a year.

Int. 16. How was the clearance in these two cutters produced?

Ans. In the cutter marked "Defendants' Exhibit Complainants' Batcheller Cutter" it was produced by bending back the teeth. In the other exhibit cutter it was produced by molding back the top surface of the teeth.

Int. 17. What part of the shoe sole are these cutters used to trim?

283 Ans. The bed of the fore part.

Int. 18. State whether or not they are used with a rand-cutter; and, if so, what kind.

Ans. They are used with a rand-cutter on a flexible shaft, such as the old-style Busell trimmer.

Int. 19. Please state, if you know, whether the parts marked in the Exhibit Complainants' Catalogue as follows, "11 cutter, Busell;" "14 cutter, feather edge, Busell;" "12 cutter, feather edge, N. S.;" "41 holder for cutters;" "42 holder, sleeve;" "109 shield No. 2;" "110 shield No. 4;" "111 shield No. 6;" "112 shield No. 8;" "113 shield, Busell cutter, large;" "114 shield, Busell cutter, small;" "116 shield, wrought bearing;" "118 flexible spindle;" "119 spindle nut;" "121 spring for holder;" "132 welt knife for molded cutter, long;" "133 welt knife for molded cutter, short;" "134 to 139 welt knives, inclusive," are now made by the complainant company and kept in stock by them; and, if so, please state as briefly as you can the uses of these parts.

Ans. The "11 cutter, Busell," is kept in stock by them, and sold and rebladed for customers when worn out, and is the same as the "Complainants' Exhibit Old Busell Cutter," for trimming fore-part edges. The "12 cutter, feather edge, N. S.," is kept in stock and sold for use with the "Batcheller" cutter and with the Orcutt cutter. The "14 cutter, feather edge, Busell," is kept in stock and sold for use with the "old Busell cutter." Shields "109," "112," "113," "114," are used with the "old Busell cutter." "Shield, wrought bearing," No. 116, is kept in stock and sold for use on the old Busell machine. "No. 118 flexible spindle" and "119 spindle nut" are used with the old Busell machine and kept in stock. Welt knives "132" and "133" were in stock when I worked for them, in 1883, and used with cutters like "Defendants' Exhibit Brown and Sharpe Slotted Cutter." Welt knives "134" to "139," inclusive, are all kept in stock and used with the old Busell cutter. No. "41 holder for cutters," No. "42 holder, sleeve," No. "110 shield," No. "111 shield," No. "121 spring for holder," are used in connection with the Orcutt cutter and not with the old Busell trimmer, and are kept in stock for sale.

Int. 20. Do you know what the cost was to customers to

284 have cutters like "Compl'ts' Exhibit Old Busell Cutter" rebladed when the blades had been worn out by use? If so, state the same.

Ans. The cost was one dollar for reblading.

Int. 21. By whom was it done?

Ans. By the Busell Trimmer Company.

Int. 22. State, if you know, from your connection with them as a salesman or otherwise, which were regarded as the preferable or

more profitable work—the manufacture of cutters like "Compl'ts' Exhibit Busell Cutter (Orcutt pat. of '81)" at three dollars each or the reblading of cutters like "Compl'ts' Exhibit Old Busell Cutter" at one dollar each.

Ans. The Orcutt cutter at three dollars each.

Int. 23. State whether or not the sale of either of the cutters referred to in the last question was favored more than the other by the complainant company; and, if so, which.

Ans. The cutters like "Complainants' Exhibit Busell Cutter (Orcutt pat. of '81)" and cutters like "Defendants' Exhibit Complainants' Batcheller Cutter No. 108" were favored more than cutters like "Compl'ts' Exhibit Old Busell Cutter," and I was instructed to use all exertions to sell those instead of the latter.

Cross-examination by J. E. MAYNADIER, Esq, of counsel for complainants:

Cross-int. 24. Do you know why oil is used upon the cutters when milling these samples, such as "Brown's milled steel bar" and the other exhibits of that class?

Ans. I suppose it is to protect the cutter and give it a chance to do its work easier. It was only used on the steel and not on the cast iron and composition. It is the practice to use oil on steel and not on composition or cast iron.

Cross-int. 25. Do you know why the speed is so widely different in milling those exhibits from what it is in trimming sole edges?

Ans. On account of its being a harder material than leather.

Cross-int. 26. Do you know why the metal is rigidly held upon a bed instead of in the hand, as is the shoe?

Ans. It is harder material than leather, and I hardly think you could hold it in your hand and mill any depth.

285 Cross-int. 27. Do you not see that the depth of cut in milling depends upon the relation of the surface of the bed and the axis of the cutter?

Ans. The depth of cut depends on the distance the work is placed from the axis of the cutter. As it would be held in the hand, the harder you press the nearer the shoe would be to the axis and the deeper cut it would make.

Cross-int. 28. Do you think that the mode of operation of a milling-cutter is substantially the same as that of a rotary sole-edge trimmer?

Ans. As far as depth of cut I don't see why not. You can arrange the work a certain distance from the axis of the cutter, and you can press the shoe to a certain distance from the axis so as to take a certain depth.

Cross-int. 29. You have not answered the question, which is, whether you think the modes of operation in the two cases are the same or not; not as to depth of cut alone, but as to that and every other matter.

Ans. I think the modes of operation are substantially the same, barring out the two different speeds of the cutter.

Cross-int. 30. Do you also think the results of the two modes of operation are substantially the same?

Ans. You get the same molding or outline in the two cases, provided you use the same cutter. That is the only result there is.

Cross-int. 31. How does the workman regulate the depth of cut in tools like Exhibit "Hand Plane?"

Ans. He regulates the depth of cut by adjusting the cutting edge a certain distance above the guide in front of the cutting edge.

Cross-int. 32. Is the part you call the guide commonly called the guide or the guard?

Ans. The guide, as I understand it. The guard is the rand guard.

Cross-int. 33. In Exhibits "Bigelow Cutter" and "Dunham Edge Cutter" the depth of cut is regulated by adjusting the guide to the cutting edge, is it not?

Ans. I should say it was.

Cross-int. 34. Mr. Andrén thinks, as I understand him, that the tools marked Exhibits "Hand Plane," "Dunham Edge Cut-
286 ter," and "Bigelow Cutter" are substantially the same in construction, mode of operation, and result as the rotary sole-edge trimmers in controversy. What is your opinion as to that?

Ans. I think they are substantially the same.

Cross-int. 35. And what part of the rotary trimmers in controversy do you think is substantially the same in construction, mode of operation, and result as the part you call the guide in those hand tools?

Ans. The cutting edge of each tooth.

Cross-int. 36. Then what part of the rotary sole-edge trimmers do you think is substantially the same in construction, mode of operation, and result as the cutting edge of the hand tool?

Ans. The tooth that is commencing to cut as the preceding one leaves the edge.

Cross-int. 37. Your answers seem to me obscure. Do you really mean that you believe the cutting edge of the rotary trimmers is substantially the same in construction and mode of operation and result as the guide of the hand tool which does not cut at all, which is what you say, as I understand you, in your 35th answer?

Ans. I believe that the preceding cutting edge of the rotary cutter when in operation is substantially the same as the guide in the hand plane.

Cross-int. 38. Do you mean the cutting edge or that part of the top surface of the tooth back of but close to the cutting edge?

Ans. I mean the cutting edge.

Cross-int. 39. Now, as to your 36th answer. Is it not clear that the cutting edge of each tooth of the rotary trimmer is the same in construction as the cutting edge of the blade of the hand plane, in a general sense, although very different in certain respects?

Ans. I think it is substantially the same as the cutting edge in the hand plane.

Cross-int. 40. Don't you think that your last answer conflicts with your 36th answer?

Ans. I don't think it does.

(Adjourned to 2 o'clock p. m.)

(Cross-examination resumed:)

Cross-int. 41. Do you not see plain substantial differences
287 in construction between the hand tools and the rotary edge-trimmers in controversy?

Ans. I don't see anything but what has its equivalent in the rotary cutter.

Cross-int. 42. What do you think is the reason why rotary sole-edge trimmers are used in preference to hand tools?

Ans. By the system of the manufacture of shoes at this period and the convenience of not having so large a number of edge-makers to look after it makes it a little more convenient to trim by machinery; and having placed that number of machines in a large number of factories it rather obliges manufacturers to use machine trimmers in order to compete with their competitors.

Cross-int. 43. Did you ever see any of the large edge-trimmers in which the shoe was jacked and in which a non-rotary tool was used?

Ans. Yes; I remember seeing one or two.

Cross-int. 44. Do you think that your cutter, Exhibit "Corthell Patent Cutter," is substantially the same in construction, mode of operation, or result as the cutters in controversy?

Ans. I should say it was substantially the same.

Cross-int. 45. Do you think that Exhibit "Thompson Rand and Sole Edge Trimmer" is substantially the same in construction, mode of operation, and result as the rotary sole-edge trimmers in controversy?

Ans. The construction varies a little, as it is in three different parts; the mode of operation and result is the same.

Cross-int. 46. Did you notice how badly the rand knife was ground in the "Thompson rand and sole-edge trimmer?"

Ans. I have not. I should hardly think it had been ground, though, since it was made.

Cross-int. 47. Do you know what patent is referred to in the patent marked on the bed-cutter of the "Thompson rand and sole-edge trimmer?"

Ans. The Knights patent.

Cross-int. 48. Is it your opinion that the "Thompson rand and sole-edge trimmer" could be sold in competition with the rotary sole-edge trimmers in controversy?

288 Ans. Yes, sir; and if the cutters in suit were sold at three dollars apiece the "Thompson rand and sole-edge trimmer" could be run for one-half the expense of the cutters in suit and do work on the edge that would stand a great deal better and longer than any cutters in suit, as will be seen by the "Defendants' Ex-

hibit Mitchell's Boot," which was trimmed by substantially the same cutter six years ago.

Cross-int. 49. Please explain fully the reasons for the difference in the work done by "Thompson's rand and sole-edge cutter" and the cutters in suit.

Ans. Well, I think it is because the cutting edges are considerably nearer together and more teeth strike the sole edge in the second than with the cutter in suit, and which, as the shoemakers say, kind of "peans" the edge down and hardens it.

Cross-int. 50. Why is it, in your opinion, that many thousands of the cutters in suit have been used for each one of the "Thompson rand and sole-edge cutters" ever made?

Ans. One great reason is because the complainant company have bought up all the patents for rotary edge-trimmer cutters and rotary rand knives that they could find, and, owing to the immense profit that was in the cutter in suit, formed a monopoly and made the innocent manufacturers believe that that was the best cutter for them to use, and not giving them any facilities for buying and using the "Thompson rand and sole-edge trimmer." Of course, they couldn't use them if they couldn't be had.

Cross-int. 51. What patents do you think cover the "Thompson rand and sole-edge trimmer?"

Ans. Well, I suppose the Knights patent would cover the chisel edge on the bed-cutter, and the Bolling the channel-cutter, and the Busell the welt knife—that is, they describe such things in their specifications.

Cross-int. 52. Why don't the defendants make the "Thompson rand and sole-edge trimmer," instead of copying the Orcutt cutter?

Ans. I presume for the same reason that the complainant company don't—that is, there is a bigger profit on the cutters in suit when sold at three dollars, and, another reason, that there is so many machines out that use the cutter in suit the manufacturers would have to change all over for a machine capable of using the Thompson cutter.

289 Cross-int. 53. Do you think that this cutter, Exhibit Stephenson Molding Cutter, is substantially the same in construction, mode of operation, and result as the rotary sole-edge cutters in suit?

Ans. I don't see any material difference. I should say it was substantially the same.

Cross-int. 54. Is it not the fact that the hand tool in operation takes off a shaving—that is, a strip of considerable length, compared to its thickness, and often an inch or more in length?

Ans. Well, in the usual practice, in using these hand planes the chips are very light—that is, very thin—and not more than three-eighths to half an inch in length. It is so thin it breaks up in going two or three inches or one side of a shoe, and will crumble up like dust by pressure in the hand, as does the coarsest chips that you will get from a rotary cutter.

Cross-int. 55. Is not the removal of a series of chips by a series of

forward motions by the hand tool a radically different mode of operation from that of the cutters in suit, in your opinion?

Ans. I think not. The operator makes short motions with his plane, and the operator trimming with a rotary cutter makes short motions with his shoes to get to a desired shape, which I consider substantially the same.

Cross-int. 56. Please reconsider this matter of the mode of operation of the hand plane and of the rotary sole-edge trimmers in suit and, bearing in mind the difference in the condition of the stock removed, the fact that the cutting edge of the hand tool travels forward and back in a path substantially parallel with the sole edge, while the cutting edge of a rotary cutter travels in a circle nearly tangent to the surface of the sole edge, and all the other differences with which you are familiar, *and* state again whether you believe the mode of operation to be substantially the same in both cases.

Ans. Of course, I understand that the hand plane don't revolve 7,000 times a minute, as does the rotary cutter, but I claim that the result and operation are substantially the same. I don't take into consideration speed at all in this answer.

Cross-int. 57. Do you know why none of the complainants' cutters in suit have been experimented with by defendants as milling-cutters, and why Mr. Andrén was silent upon the feasibility of using them for milling metal?

290 Ans. I know nothing about Mr. Andrén whatever on that point, but the reason that I have never milled or caused to be milled with complainants' cutters like Exhibit "Busell Cutter, Orcutt pat. of '81," is on account of the thinness of the stock at the base of the tooth. I knew that they would break off in trimming leather and that they would be liable to break off or bend back more in milling metal.

Redirect:

Int. 58. In cross-int. 42 you were asked your opinion "why rotary sole-edge trimmers are used in preference to hand tools." Please state, in addition to your answer given to that interrogatory, whether or not you think the introduction of other and earlier machinery for other parts or branches of shoe manufacturing has had an influence in aiding the introduction of shoe-sole trimming machinery, and state your reasons for such opinion as you may give.

Ans. I believe it has. My reasons are that in the commencement of introducing rotary edge-trimmers the only success we had was in those factories having a full or nearly full line of shoe machinery, and in talking with a great many manufacturers of shoes about placing trimming machines in their factories their main reasons and excuses for not even trying our machines were that they would have first to reorganize and introduce other machinery in order to make trimming machines of any advantage to them. In some shops employing steam power and machinery for other branches of their work to-day their variety of styles is so numerous they will not introduce and use sole-edge trimming machines, although some have tried them, for the reason, as they claim, and I agree with

them, there is no advantage to them in using such trimmers. Among those referred to who do not now use them but who run other machinery by power are: Lilly, Brackett & Co., of Brockton; Nahum Johnson, of Brockton; J. W. Hart & Co., of Weymouth; Edwin Clapp, of East Weymouth; Cox, Young & Gardner, of Boston; Whitcher, of Quincy, and many others whose names I do not recall at this moment.

Int. 59. You have been inquired of in cross-examination and have answered in relation to the cutting edge of the teeth in the Orcutt cutter serving as a guard each for the other. Please examine the Defendants' Exhibit Worn Cutters, respectively, marked "No. 5, P. F. B.," and "No. 11, S. T. T. B.," and state whether you find any other guard than the cutting edge of the blades.

291

Ans. I don't find any other and don't see any possibility of there being another.

(Adjourned to April 28, 1885, at 10 a. m.)

BOSTON, *April* 28, 1885.

Cross resumed:

Cross-int. 60. Don't you see that the guard in the "worn cutters" is the top of each tooth, precisely as the molded surface of the part you call guide in the hand tool is the guard for the cutting edge of the hand tool, or are you unable to distinguish between the cutting edge and the surface back of the cutting edge in the worn cutters?

Ans. I can see only a very thin portion of the top or molded surface of the tooth in the worn cutter marked "No. 5, P. F. B.," and I don't believe that any other portion of the tooth except the extreme cutting edge acts as a guide or guard in any sense whatever. I have used cutters where the teeth were ground away full two-thirds thinner than these, and they trimmed smooth, and that is my reason for believing that the extreme cutting edge is the only guard.

Cross-int. 61. Then you don't see that it is simply impossible for the cutting edge to be a guard, do you?

Ans. I do not.

Cross-int. 62. Do you see that the cutting edge of each tooth of the cutters in suit is not only moved away from the sole edge after making an extremely short cut, but is also pried out of the leather by the action of the molded surface of the tooth back of the cutting edge?

Ans. I don't see anything of the kind. I don't see how it would be possible for the top part of a tooth to have any time to pry out the cutting edge at the great speed the cutter revolves and with 1,800 teeth striking the sole edge per second.

Cross-int. 63. And yet you know, don't you, that if you tip the handle of a hand plane back while you are shoving it forward the molded surface of the blade back of the cutting edge will pry the edge out of the leather?

Ans. That is a possibility, but no probability of doing anything of the kind in practical operation.

292 Cross-int. 64. Isn't it absolutely certain that you will pry the cutting edge out if you do tip the handle back?

Ans. Yes; certainly.

Cross-int. 65. And don't you now see that each cutting edge of the cutters in controversy enters the leather as the edge of the hand plane would if the handle were tipped forward and leaves the leather as the edge of the hand plane would if the handle were tipped sharply backward? Moreover, is this not too plain for rational dispute?

Ans. I consider it very plain, by placing a scale from one cutting edge to another, that the following cutting edge takes hold before the top of the preceding tooth would have any chance to pry out the preceding cutting edge.

Cross-int. 66. What is the practical effect of having the cutters in suit too rank? For example, suppose each tooth of the cutters in suit had an edge whose flat front face was so much inclined to the molded top as is the flat front face to the molded top of the blade of the hand tool.

Ans. If all the cutting edges in a rotary cutter constructed on that plan were the same distance from the center it would trim a smooth, nice edge; but I find that what edge-trimmer operators call rank cutters are merely cutters where there are numbers of the cutting edges that vary in distances from the center. I have made practical experiments of cutters at various angles on their front face that were called too rank to use, and by grinding them so that each cutting edge was the same distance from the center they would perform their work as well as any cutter.

Cross-int. 67. Do you think that a cutter of the kind in suit, with the angle between the flat front face and the molded top of each tooth, the same as in the hand-plane blade, would work at all if the curve of the molded top of each tooth were largely eccentric to the axis of the cutter? Assume, of course, that the cutting edges are equidistant from the axis of the cutter.

Ans. I most certainly do, and I answer from practical experiments.

Cross-int. 68. Why are these cutters not made that way, in your opinion?

Ans. With the complainants' cutter I don't think the teeth would stand bending much more, and the defendants' cutter—it
293 would be too expensive waste, the amount of time it would take to mold them back very eccentric.

Cross-int. 69. How do you think the cutters in suit would work with the angle between the flat front face and molded top of each tooth, the same as in the hand-plane blade—first, without clearance, and, second, with the small amount of clearance which you find in the cutters in suit?

Ans. They would not do much cutting without clearance. With the clearance on the cutters in suit they would cut very smoothly.

Cross-int. 70. Why are they not made, in your opinion, with the

angle between the flat front face and the molded top, the same as in the hand-plane blade?

Ans. I don't consider it would be practical to make them that way. It would decrease the durability of each tooth.

Cross-int. 71. What do the letters "P. F. B." and "S. T. T. B." on the "worn cutters" mean?

Ans. There were so many abbreviations of that kind when cutters were marked that way, and as that style of marking was disused three years ago or more, I cannot call to mind what they do mean.

Redirect:

Int. 72. In cross-interrogatories 60 to 63 you have been inquired of in relation to the tops of the teeth in complainants' cutter acting as a guard. Please examine "Complainants' Exhibit Burr Cutter" and state whether you have trimmed shoe-sole edges with cutters like them; and, if so, state further whether you found any lack of the requisite guard to keep the shoe sole at its proper distance from the axis of the cutter.

Ans. I have. It requires as much pressure upon the shoe, and, if anything, more, to hold the shoe in contact with this cutter when trimming with it than when trimming with any other cutter I have ever used.

Int. 73. Please answer the same question with relation to "Complainants' Exhibit Rounds' Rand and Edge Cutter" and "Complainants' Exhibit Coté Cutter, Knights' patent."

Ans. I have trimmed with the cutters referred to, and it
294 requires about the same pressure as with the cutter referred to in the preceding question.

Int. 74. Please answer the same question in relation to "Complainants' Exhibit Old Busell Cutter."

Ans. I have trimmed with cutters like this. It requires about the same pressure with this cutter as it does with the Exhibit "Busell Cutter, Orcutt pat. of '81."

Int. 75. If the top or edge of the teeth in complainants' cutter performs any duty as a guard, as claimed by complainants, do or not, in your opinion, the teeth in Complainants' Exhibits "Burr Cutter," "Rounds' Rand and Edge Cutter," "Coté Cutter, Knights' patent," and "Old Busell Cutter" perform the same office or duty?

Ans. Exactly the same.

SAMUEL N. CORTHELL.

Stipulation.

It is hereby agreed that the printed record in the suit entitled Busell Trimmer Co. *et al. v.* Corthell Manufacturing Co. *et al.*, numbered 1673 on the equity docket of this court, be used as a part of the record in this case without being reprinted.

J. E. MAYNADIER,
Solicitor for Complainants.
T. W. PORTER,
Of Counsel for Defendants.

Stipulation.

It is hereby agreed that defendants' answer shall be amended by adding to the list of anticipatory patents therein recited that of C. P. Bigelow, No. 88264, dated March 30, 1869, and by adding to the list of names therein of persons having prior knowledge of Orcutt's alleged invention that of W. C. Young, of and at Worcester, Mass.

EUGENE HUMPHREY,
Special Examiner.

295 *Amendment to Defendants' Answer.*

It is hereby agreed that defendant- may amend *his* answer by inserting therein the name of Richard Stevenson, of Boston, Massachusetts, as one of the persons having prior knowledge, at Lawrence, Massachusetts, of the cutter described and claimed in complainants' patent.

J. E. MAYNADIER,
Solicitor for Complainants.

DEFENDANTS' EXHIBIT COPY OF FILE WRAPPER AND CONTENTS ORCUTT PATENT, 1881. W. A. C., Sp'l Ex'r.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the files of this office of the file wrapper, contents, and drawing in the matters of the letters patent granted William D. Orcutt March 1, 1881, No. 238,303, for improvement in rotary cutters for trimming the edges of boot and shoe soles.

In testimony whereof I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be affixed this twenty-fifth day of February, in the year of our Lord one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and sixth.

[SEAL.]

E. M. MARBLE,
Commissioner.

BOSTON, *Jan. 2nd*, 1879.

Hon. Comm'r of Patents.

SIR: I herewith send you the application complete of Wm. D. Orcutt (case B) for a patent for rotary cutter, the receipt of which please acknowledge and oblige,

Yours respectfully,

N. C. LOMBARD,
Att'y for W. D. Orcutt.

296 Model, 1 dr.; $15, cert.

Petition.

(Case A.)

To the Commissioner of Patents:

The petition of William D. Orcutt, of Boston, in the county of Suffolk and State of Massachusetts, respectfully represents that your petitioner has invented certain new and useful improvements in rotary cutters for trimming the edges of boot and shoe soles, which he verily believes have not been known or used prior to the invention thereof by your petitioner. He therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same upon the terms and conditions expressed in the act of Congress in that case made and provided, he having paid fifteen dollars into the Treasury and complied with the other provisions of said act, and hereby authorizes N. C. Lombard, of the city of Boston, to act as his attorney in presenting this application to alter or withdraw the same, as the case may require, to sign his drawings, and to receive the patent when granted, with full power to appoint such other person to act in his stead as he may deem expedient.

WILLIAM D. ORCUTT.

Oath.

STATE OF MASSACHUSETTS, } *ss:*
County of Suffolk, }

On this second day of January, 1879, before the subscriber, a justice of the peace for said county, personally appeared the within-named William D. Orcutt and made solemn oath that he verily believes himself to be the original and first inventor of the within-described improvements in rotary cutters for trimming the edges of boot and shoe soles, and that he does not know or believe the same was ever before known or used, and that he is a citizen of the United States.

N. C. LOMBARD,
Justice of the Peace.

297 *Specification.*

To all whom it may concern:

Be it known that I, William D. Orcutt, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in rotary cutters for trimming the edges of boot and shoe soles, of which the following, taken in connection with the accompanying drawings, is a specification.

On the margin was written with red ink the following: "Erase and insert (A), am'd't sub. spec., Jan'y 6, 1881."

My invention relates to that class of rotary cutters in which a series of cutting blades are detachably secured to a common hub, from the periphery of which they all project outward at a uniform

angle, and is especially applicable to cutters designed to form upon the sole a fancy or moulded edge, and it consists, first, in a novel method of constructing such cutters, whereby the necessary "backing off," so called, or clearance of each cutting blade is readily and easily produced without danger of changing the form given to the outer or peripheral ends thereof, as will be further described.

On the margin was written with red ink the following: "Insert (1) am'd't, Feb'y 19, '79."

It further consists in the use of a series of cutting blades detachably secured to and projecting outward from a common hub and having their outer or peripheral ends or edges moulded to a uniform shape—the counterpart of the shape that it is desired to give to the sole edge—with their cutting corners equidistant from a common center, about which said cutter revolves when in use, all so constructed that each blade may be readily sharpened by grinding its front radial or nearly radial face without danger of changing in the least the form of its moulded edge, said blade being readily removed from the hub for the purpose of sharpening upon a common grindstone, if desired, when a thin emery wheel and suitable mechanism for grinding the blade while in the hub is not readily accessible.

In the drawings, figure 1 is an elevation of a construction hub and a set of cutter blades in the position in which they are set to turn off or mould their outer or peripheral edges.

Figure 2 is a side elevation of a finished cutter, and

298 Figure 3 is on edge view of the same.

In all rotary cutters it is necessary, in order to do good work, that the outer or peripheral edge of each blade should be properly "backed off" or leave suitable clearance, or, in other words, that that part of said peripheral edge which passes over the stock last should be at a slightly less distance from the axis of motion than the cutting corner of said blade.

In straight cutters this is easily accomplished by grinding the outer or peripheral edge beveling or at a slight angle to the line of motion of the cutting edge, but when it was desired to form a cutter which would impart a moulded edge to the article operated upon or cut a curved or moulded groove in said article of any desired ornamental shape it was a laborious and expensive operation, as in making the cutters from a single piece of metal, as heretofore largely practised for this class of work. If it was desired to mould the periphery of the cutter to a counterpart of the cut that it was desired to make, it became necessary to turn off the outer ends or edges of the cutter teeth concentric to the axis of the cutter and then cut away the stock of said outer surface of each tooth separately to give the desired "backing off" or clearance by chipping and filing by hand or by the use of a complex and expensive machine, thereby making the cutters necessarily expensive.

To obviate this difficulty and produce a better cutter at less cost is the object of my present invention, and to accomplish this desirable end I make the cutting blades separate from the supporting

hub and of uniform shape and size, with their front or rear faces parallel or nearly so to each other, and attach them to said hub in substantially the same manner as described in letters patent No. 210,006, granted to James H. Busell November 19, A. D. 1878.

On the margin was written with red ink the following: "Am'd't, Feb'y 19, '79."

To construct my improved cutter I first provide a hub or ring of metal, A, fitted to be attached to a suitable arbor or shaft, and cut longitudinally through its periphery a series of dovetailed grooves, *a a*, the side walls of which are inclined to a radial line and to each other about as indicated by the dotted lines *b* and *c*, as shown in Fig. 1. I then plane the inner edges of the several blades *d*
299 *d* to fit said grooves tightly, and drive them endwise into the same, as shown in figure 1.

The hub A, with the teeth or blades *d d* set therein, is secured upon an arbor, and the outer edges of the blades are turned off to any desired form to suit the design that it is desired to produce upon the sole edge, the outer or peripheral surface of each of said blades when so turned off being concentric with the axis of the hub in which they are set, and in that condition are worthless, or nearly so, for the purposes of trimming sole edges.

The blades *d d* are then driven out of the hub A, hardened, and are then reset in the hub B, made precisely like A, except that the sides of the grooves *l l* formed in its periphery are not inclined to so great an angle to a radial line as the sides of the grooves *a a* in hub A, by which the blades when driven into the hub B stand at a less inclination to a radial line than when they were turned off in the hub A, and their outer or peripheral surfaces are thrown into a position eccentric to the axis of the cutter.

It is obvious that this method of producing the "backing off" is applicable to detachable blades, whether secured to the hub in the identical manner above described or in some other way, without changing the principles of my invention, which consists in moulding the peripheral edges of cutting blades while secured to a common hub at a given angle, and then securing them to the hub in which they are to be used at a different angle.

What I claim as new, and desire to secure by letters patent of the United States, is—

1st. The method herein described of producing the "backing off" or clearance in the blades of rotary cutters, which consists in turning off the outer or peripheral edges of said blades while set at a given angle, and then setting them in the hub in which they are to be used at a different angle, substantially as herein set forth.

2d. A rotary cutter provided with a series of cutting blades detachably secured to a common hub and having their front and rear radial or nearly radial faces parallel to each other and their outer or peripheral edges moulded to a counterpart of the desired orna-

On the margin was written with red ink the following: "Am'd't, Feb. 7, '79."

mental shape to be given to the sole edge, and adapted to be
300 sharpened by grinding the front radial face of each blade without changing the shape of its moulded peripheral edge, substantially as and for the purposes described.

On the margin was written with red ink the following: "Am'd't, May 28, '79."

Executed at Boston, Mass., this 2nd day of January, A. D. 1879.
WILLIAM D. ORCUTT.

Witnesses:
N. C. LOMBARD.
C. H. DODD.

Room No. 95.

Case A.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Jan'y 15th*, 1879.

Rotary cutters. Jan'y 6, 1879.

Wm. D. Orcutt, care N. C. Lombard, No. 40 State St., Boston, Mass.:

In this application the 2d clause of claim is anticipated by Corthele of Aug. 27, 1878, No. 207,395, boots & shoes, burnishing.

The 1st clause pertains to metal-working, and will receive separate consideration after the 2nd clause shall have been disposed of.

J. P. CHAPMAN, *Ex.*

BOSTON, *Jan. 20th*, 1879.

Hon. Comm'r of Patents.

SIR: In the matter of the application of Wm. D. Orcutt for a patent for rotary cutter (case A), filed Jan. 6th, 1879, I beg leave to present the following:

After a careful examination of Corthel's patent of Aug. 27th, 1878, cited as a reference in this case as anticipating the 2nd clause of claim, and having one of the Corthel cutter blades before me as I write, I am constrained to say, with all due respect for the opinion of the examiner in charge, that I do not think that Corthel's patent in any proper sense anticipates applicant's 2nd claim.

301 I think that a careful examination of a single blade of Corthel's cutter and a comparison of it with one of Orcutt's will show to the examiner the difference between the two, and also that if Corthel's cutter was patentable, then Orcutt's is none the less so.

Corthel's blades have their front radial faces molded, while Orcutt's have their outer or peripheral ends molded and their front and rear radial or nearly radial faces parallel with each other. Corthel's blades are sharpened by grinding their outer ends to a straight bevel, and any variation of the angle of said bevel changes the form of the molding that will be produced by the cutter upon the edge of a boot or shoe sole.

In the sketch given on the left I show three views of the Corthel cutter blade, in which *a* is the front radial face, *b* the rear radial face, and *c* the outer or peripheral end ground to a straight bevel.

In the sketch here given three similar views of Orcutt's cutter blade are shown, in which *a* is the front radial face, *b* the rear radial face, and *c* the outer or peripheral edge moulded to the desired pattern, the blade being sharpened by grinding the radial face *a*. These blades are all set in the construction hub and turned off to the desired pattern all at the same time, so that their outer edges are all exactly alike and equidistant from the centre of the hub. This cannot be done in the case of Corthel's cutter. His blades are cut from the end of a strip of steel that has had one side molded by planing it in a planer to the desired pattern. Each blade is then fitted to the dovetail in the hub, and then its outer end is ground to the desired bevel and length; and I think it will be obvious to the examiner that it is a nice point to grind all of a set of cutter blades to exactly the same length and bevel, and it will also be observed that if said blades are not so ground there might as well be but one blade as more.

In view of the differences above set forth I submit that Orcutt is entitled to his 2nd claim as for anything shown or described in the Corthell patent, and I respectfully ask that the case be reconsidered, and that the 2nd claim be allowed.

Very respectfully,

N. C. LOMBARD,
Att'y for W. D. Orcutt.

302 Room No. 95.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Jan'y 27th*, 1879.

Wm. D. Orcutt, care of N. C. Lombard, No. 40 State St., Boston, Mass.:

Case A. JAN'Y 6TH, 1879. 34–2.

In further consideration of this case applicant is advised that the 2d clause of claim appears to be covered by the reference cited, and that such construction of claim would be warranted if the patented references were before the office for a reissue. The devices claimed as also embraced in the reference are not alike, but the broadly constructed claim is equally applicable to one as to the other.

J. P. CHAPMAN, *Ex.*

BOSTON, *Feb. 5th*, 1879.

Hon. Comm'r of Patents.

SIR: In the matter of the application of Wm. D. Orcutt for a patent for rotary cutter (case A), filed Jan. 6th, 1879, I will amend the specification as follows:

After "having their," in the 3rd line of the 2d clause of claim, insert front and rear radial or nearly radial faces parallel to each other and their.

This limitation, I think, should remove all conflict between Or-

cutt's 2nd claim and the reference cited, and I respectfully ask that said claim be allowed.

Yours respectfully, N. C. LOMBARD,
Att'y for W. D. Orcutt.

303 Room No. 95.

DEPARTMENT OF THE INTERIOR,
Case A. UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb'y* 10, 1879.

Wm. D. Orcutt, care N. C. Lombard, No. 40 State St., Boston, Mass.:

34–2. JAN'Y 9, 1879.

Applicant is advised that the amendment would appear to confer no change in the claim outside of mere configuration, and only some practical utility can be shown to result from such configuration or parallelism of parts. The reference cited must be accepted as a pertinent one.

J. P. CHAPMAN.

BOSTON, *Feb.* 17*th*, 1879.

Hon. Comm'r of Patents.

SIR: In the matter of the application of Wm. D. Orcutt for a patent for rotary cutter (case A), filed Jan. 6th, 1879, and in reply to the official letter of the 10th inst., I beg leave to say that the advantages of making the cutting blades with their radial or nearly radial faces or sides parallel with each other and molding the outer or peripheral edges thereof, as described and claimed by Orcutt, as compared with a cutter blade having its front radial face molded and its outer or peripheral edge ground straight, as in the reference cited in this case, are very much less cost of construction, for the reason that Orcutt's cutters can be cut from a bar of steel of the proper dimensions without planing, while the cutter described and shown in the reference must be planed in order to form the molding on the side of said bar before cutting the bar into short pieces. Again, to make the cutter shown and described in the reference requires a bar of steel of about double the thickness needed to make Orcutt's blade. Less labor is required to fit Orcutt's blades to their hub than is required to fit those shown in the reference, as
304 there is less metal to cut away. Orcutt's blades are much more likely to be of uniform shape at their cutting edges and of equal length from the axis of the cutter head, from the fact that the outer peripheral edges of Orcutt's blades are all formed at one and the same time by turning them in a lathe while set in the construction hub, and therefore must be exactly alike and of equal length, which cannot be the case with the cutter described in the reference cited.

These advantages, it seems to me, ought to be sufficient grounds for granting a patent, and I submit that Orcutt is entitled to his second claim.

I will, however, amend the specification as follows: After "hav-

ing their," in the 17th line, 1st written page, insert: front and rear radial or nearly radial faces parallel or substantially so to each other and their.

After "size," in the 20th line, 3d page, insert: with their front and rear faces parallel or nearly so to each other.

Hoping that these amendments, with their advantages above set forth, will remove all objections to the grant of the patent, I remain,

Yours respectfully,

N. C. LOMBARD,
Att'y for Wm. D. Orcutt.

Room No. 95.

DEPARTMENT OF THE INTERIOR,
Case A. UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb'y* 20, 1879.

Wm. D. Orcutt, care N. C. Lombard, 40 State St., Boston, Mass.:

34–2. JAN'Y 6, 1879.

This matter has received further consideration in connection with letter and amendment filed the 19th inst., and the 2d clause of claim is again refused upon reference cited in former letter. There does not appear to be any appreciable functional difference, and the matter of configuration as emphasized in the 2d clause is merely a matter of degree in view of the reference.

J. P. CHAPMAN, *Ex.*

305 Room No. 95.

DEPARTMENT OF THE INTERIOR,
Case A. UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *May* 28, 1879.

Wm. D. Orcutt, care N. C. Lombard, Boston, Mass.:

34–2. JAN'Y 6, 1879.

The 1st clause of claim is anticipated by Brown of Nov. 29, 1864, No. 45294; also Harrington of Sep. 22, 1868, No. 82402, milling-cutters.

J. P. CHAPMAN, *Ex.*

BOSTON, *May 27th*, 1879.

Hon. Comm'r of Patents.

SIR: In the matter of the application of Wm. D. Orcutt for a patent for rotary cutter, filed Jan. 6, 1879, and in reply to the official letter of the 20th of Feb., 1879, I beg leave to say that there is a very essential functional difference between the cutter of Corthel and applicant's cutter, inasmuch as Corthel's cutter is very much more difficult to make, and consequently more expensive and much more difficult to keep in working condition when once made, as any change of the angle of the peripheral face in sharpening the blade changes the shape of the moulding very materially, while

Orcutt's blades are all turned to the desired shape at one and the same time, and consequently are all of exactly the same shape and length, and by grinding them on their front radial faces their shapes are maintained in exact uniformity without trouble. In view of this I would respectfully ask for a reconsideration of the case and an allowance of the claims, as I will now amend the 2nd.

Erase "either while in the hub or after removing it therefrom," in the 8th and 9th lines of the 2nd claim, and insert "without changing the shape of its molded peripheral edge."

Yours respectfully, N. C. LOMBARD,
Att'y for Wm. D. Orcutt.

306 Room No. 6.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *May* 28, 1879.

The application (A) of W. D. Orcutt for a patent for rotary cutter, filed Jan. 6, 1879, submitted to me by Examiner Chapman for examination as to novelty of the invention alleged in 1st claim, has been considered and said invention found anticipated in patents for milling-cutters to J. R. Brown, 45294, Nov. 29, 1864, and J. Harrington, 82402, Sept. 22, 1868.

J. W. JAYNE, *Ex.*

BOSTON, *January 4th*, 1881.

Hon Comm'r of Patents, Washington, D. C.

SIR: In the matter of my application for a patent for rotary cutter (A), filed Jan. 6, 1879, I hereby amend by erasing the specification (except the signatures) and all amendments thereof now on file, and substituting therefor the following specification and by cancelling the sheet of drawings now on file and substituting the sheet of drawings sent herewith:

To all whom it may concern:

Be it known that I, William D. Orcutt, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in rotary cutters for trimming the edges of boot and shoe soles, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to that class of rotary cutters consisting of a series of cutting blades arranged about a common hub, and it consists in certain peculiarities of construction of the blades, more fully described below.

Figure 1 is a perspective view of one form of rotary cutters embodying my invention.

Figures 2 and 3 are perspective views (enlarged for greater clearness) of the upper portion of one of the blades.

Figure 4 is a cross-section, enlarged, illustrating my improved cutter as used.

307 The blades *d* of my improved cutter have a flat front face, *a*, a flat rear face, *b*, and a top surface, *c*. A number of ridges, 1 2, extend across this top surface or circumferentially of the cutter, making what is called a moulded or fancy surface, which is the converse of the sole edge desired, every ridge, 2 2, making a corresponding depression in the sole edge. The ridge 1, at the side of the cutter, and, when in use, next the rand guide, takes out the rand or welt.

The main feature of my invention consists in the blade thus formed with a flat front face and a moulded or fancy top surface, the converse of the sole edge, and having the ridge 1 or the ridges 2 2, either or both, extending across its top surface—that is, extending from front to back, as shown in the drawings—my improved cutter having a series of such blades, the cutting edges of each blade extending to one side of the cutter to adapt it for use on the edge of the sole next the upper, and each cutting edge having the same relation with the axis as all the others.

Each blade *d* is shown in this instance as a *distant* piece secured to a hub, *d'*, substantially as in United States patent No. 82402 to Harrington, dated Sept. 22nd, 1868. My invention, however, does not relate to the mode or process of manufacture, but to the article of manufacture, and the blades and hub may be in one piece and constructed by any suitable mode or process too well known to need description, and I disclaim as any part of my invention both the cutters and both the modes of manufacture described in the patent to Harrington above named and in the patent to Brown No. 45294, dated Nov. 29th, 1864.

The flat front faces *a* of the blades are not radial, but are so inclined as to make each blade slightly hooking, and thereby form a knife edge at the intersection of the flat front face with the top surface *c* and its ridges 1 2 2. This is very desirable, for if the front faces *a* be not so inclined the tool will be a scraper rather than a strong cutter.

The blades are made quite thick from front to rear, so that they may be ground back as they become dulled, and they are ground only on their front faces *a*, these faces being always maintained at substantially the same pitch. The grinding is done with a flat grinding surface (the flat side of a small emery wheel), and does not alter at all the shape of the cutting edge of the blade. The tops *c*
308 and ridges 1 2 2 are inclined rearwards to give the necessary clearance, as will be well understood.

I am aware of the patent No. 207,395 to Corthell, but in that cutter each blade is flat on top and its front face is moulded, the cutting edge being formed by the intersection of the flat top and moulded front face, and the ridge corresponding to the ridge 1 of my cutter is across the front face of the blade or nearly radial, instead of across the top *c* of the blade or nearly circumferential, as in my cutter. The same is true of the ridges corresponding to the ridge 2 of my cutter when the ridge 1 is across the front face of the blade or nearly radial, instead of across the top *c* of the blade or nearly circumferential, as in my cutter. The same is true of the ridges

corresponding to the ridges 2 of my cutter. When the ridge 1 is at one side of the front face, as in Corthell's cutter, the height of the projection above its base is limited by the necessary closeness together of the blades; moreover, the depth of cut is always less than the height of the projection. The main object of my invention is to provide a sole-edge cutter in which the depth of cut is the same as the height of the projection and in which the height of the projection is not limited by the closeness together of the blades.

I am also aware of the patents to Brown and Harrington above mentioned, but both those cutters are wholly unsuited for trimming sole edges and both lack the ridge 1 at one side of the top surface of the blade for taking out the rand, and also lack the ridges 2 2 for beading the sole edge.

I disclaim, therefore, all that is shown in either of the above-named patents.

What I claim as my invention is—

A rotary cutter for trimming sole edges, the blades *d* of which are formed with a flat front face, *a*, and a top, *c*, the converse of the edge to be trimmed, and which has a proper clearance and is provided with one or more circumferential ridges 1 2 2 for taking out

On the margin was written with red ink the following: "Erase & insert (B) am'd't Jan'y, 1880."

the rand or forming a bead on the sole edge, or both, as above described.

WILLIAM D. ORCUTT,
By N. C. LOMBARD,
His Attorney.

309 Room No. 95.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Jan'y* 8, 1881.

Wm. D. Orcutt, care N. C. Lombard, No. 40 State St., Boston, Mass.:

No. 34-2. JAN'Y 6, 1879.

In further action upon this matter in connection with amended specification, applicant is advised that the claim is broader than can be allowed in view of the state of the art. The expression "the converse of the edge to be trimmed" is not pertinent, which will be obvious. It is also obvious that the expression "one or more ridges" is unwarranted for the state of the art. A claim may be submitted limited to the cutter blade as definitely constructed, which will receive consideration.

J. P. CHAPMAN, *Ex.*

BOSTON, *Jan.* 17*th*, 1881.

Hon. Comm'r of Patents.

SIR: In the matter of the application of Wm. D. Orcutt for a patent for rotary cutter (case A), filed Jan. 6th, 1879, I will amend the specifications as follows:

Erase the claim and insert—

On the margin was written with red ink the following: "Erase & insert (C), am'd't, Jan'y 24, '81."

1st. A rotary cutter for trimming sole edges, the blades of which are provided with a flat front face, *a*, and a top, *c*, which top has a proper clearance, and is provided at one side with the circumferential ridge 1 for taking out the rand as above described.

2nd. A rotary cutter for trimming sole edges, the blades of which are provided with a flat front face, *a*, and a top, *c*, which top has a proper clearance, and is provided with the circumferential ridge 2 for forming a bead on the sole edge as described.

Yours respectfully,

N. C. LOMBARD,
Att'y for W. D. Orcutt.

310 Room No. 95.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Jan'y* 20, 1881.

Wm. D. Orcutt, care N. C. Lombard, No. 40 State St., Boston, Mass.:

No. 34–2. JAN'Y 6, 1879.

Upon further action in this matter the 1st clause of claim is refused in view of Corthell of Aug. 27, 1878, No. 207,395, burnishing. The 2d clause is believed to cover all of patentable invention shown and described.

J. P. CHAPMAN, *Ex.*

BOSTON, *Jan.* 22*nd*, 1881.

Hon. Comm'r of Patents.

SIR: In the matter of the application of Wm. D. Orcutt for a patent for rotary cutters, filed Jan. 6th, 1879, A, I will amend the specification as follows:

Erase the claims and insert the following:

1st. A rotary cutter for trimming sole edges, the blades *d* of which are provided with flat front faces, *a*, and have their outer or peripheral ends, *c*, moulded throughout to a uniform shape, the converse of the desired shape to be given to the sole edge, and slightly eccentric to the axis of the cutter, substantially as described.

2nd. A rotary cutter for trimming sole edges, the blades *d* of which are each provided with a flat front face, *a*, and a slightly eccentric outer or peripheral end, *c*, having formed thereon the end ridges 1 and 2, extending circumferentially across said face, substantially as and for the purposes described.

Yours respectfully,

N. C. LOMBARD,
Att'y for Wm. D. Orcutt.

311 DEPARTMENT OF THE INTERIOR,
U. S. PATENT OFFICE,
WASHINGTON, D. C., *Jan.* 28, 1881.

William D. Orcutt, care N. C. Lombard, No. 40 State St., Boston, Mass.

SIR: Your application for a patent for an improvement in rotary cutters for trimming the edges of boot and shoe soles, filed Jan. 6th, 1879, has been examined and allowed.

The final fee, twenty dollars, must be paid and the letters patent bear date as of a day not later than six months from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least twenty days prior to the conclusion of the six months allowed them by law. The printing, photo-lithographing, and engrossing of the several patent parts preparatory to final signing and sealing will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, distinctly and plainly written, the name of the inventor and title of invention as above given, date of allowance (which is the date of the circular), date of filing, and, if assigned, the names of the assignees.

If you desire to have the patent issue to assignees an assignment containing a request to that effect, together with the fee for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of specifications and drawings will be charged for at the following rates: Single copies, uncertified, 25 cents;
312 twenty copies or more, 10 cents each. The money should accompany the order.

Very respectfully,
E. M. MARBLE,
Commissioner of Patents.

On the margin was written with red ink the following: The within title is that given by the examiner in charge as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons must be given therefor on or before the payment of the final fee.

Across the face of the note was written with red ink the following: ☞ In remitting the final fee give the serial number at the head of this notice.

$20, cert. BOSTON, *Feb. 5th*, 1881.

Hon. Comm'r of Patents.

SIR: Enclosed find certificate of deposite for $20 to pay final fee on the application of Wm. D. Orcutt for a patent for "rotary cutter

for trimming the edges of boot & shoe soles," filed Jan. 6th, 1879, and allowed Jan. 28th, 1880.

Please acknowledge receipt and oblige

Yours,

N. C. LOMBARD,
Att'y for W. D. Orcutt.

1879. Chapman.

No. 238,203. "Case A." $\frac{3}{2}\frac{4}{2}$.

William D. Orcutt,
Of Boston,
County of Suffolk,
State of Massachusetts.
Rotary cutters for trimming the edges of boot & shoe soles.
Rec'd Jan'y 6, 1879.
Petition, " "
Affidavit, " "
Specification, " "
Drawing, " "
Model, " "
313 Cert. dep., $15, Jan'y 6, 1879.
Cash.
Add'l fee, cert. $20, Feb. 9, 1881.
" " cash.
Examined Jan'y 25, 1881; Chapman, ex.
Issue, Jan. 27, '81, I. W. Babson.
Patented Mar. 1, 1881.
Circular, Jan. 28, '81.

N. C. LOMBARD,
40 *State St., Boston, Mass.*

UNITED STATES PATENT OFFICE.

WILLIAM D. ORCUTT, of Boston, Massachusetts.

Rotary Cutter for Trimming the Edges of Boot and Shoe Soles.

Specification forming part of Letters Patent No. 238,303, dated March 1, 1881; application filed January 6, 1879.

To all whom it may concern:

Be it known that I, William D. Orcutt, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in rotary cutters for trimming the edges of boot and shoe soles, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to that class of rotary cutters consisting of a series of cutting blades arranged about a common hub, and it consists in certain peculiarities of construction of the blades more fully described below.

Figure 1 is a perspective view of one form of rotary cutter embodying my invention. Figs. 2 and 3 are perspective views (en-

larged for greater clearness) of the upper portion of one of the blades. Fig. 4 is a cross-section enlarged illustrating my improved cutter as used.

The blades *d* of my improved cutter have a flat front face, *a*, a flat rear face, *b*, and a top surface, *c*. A number of ridges, 1 2, extend across this top surface or circumferentially of the cutter, mak-
314 ing what is called a "molded" or "fancy" surface, which is the converse of the sole edge desired, every ridge, 2 2, making a corresponding depression in the sole edge, the ride 1 at the side of the cutter, and when in use next the rand guide takes out the rand or welt.

The main feature of my invention consists in the blade thus formed, with a flat front face and a molded or fancy top surface the converse of the sole edge, and having the ridge 1 or the ridges 2 2, either or both, extending across its top surface—that is, extending from front to back, as shown in the drawings—my improved cutter having a series of such blades, the cutting edges of each blade extending to one side of the cutter to adapt it for use on the edge of the sole next the upper, and each cutting edge having the same relation with the axis as all the others. Each blade *d* is shown in this instance as a distinct piece secured to a hub, *d'*, substantially as in the United States patent No. 82402 to Harrington, dated September 22, 1868. My invention, however, does not relate to the mode or process of manufacture, but to the article of manufacture, and the blades and hub may be in one piece and constructed by any suitable mode or process too well known to need description, and I disclaim as any part of my invention both the cutters and both the modes of manufacture described in the patent to Harrington above named and in the patent to Brown, No. 45294, dated November 29, 1864.

The flat front faces *a* of the blades are not radial, but are so inclined as to make each blade slightly hooking, and thereby form a knife edge at the intersection of the flat front face with the top surface *c* and its ridges, 1 2 2. This is very desirable, for if the front faces *a* be not so inclined the tool will be a scraper rather than a rotary cutter.

The blades are made quite thick from front to rear, so that they may be ground back as they become dull, and they are ground only on their front faces *a*, these faces being always maintained at substantially the same pitch. The grinding is done with a flat grinding surface (the flat side of a small emery wheel), and does not alter at all the shape of the cutting edge of the blades. The tops *c* and ridges 1 2 2 are inclined rearward to give the necessary clearance, as will be well understood.

I am aware of the patent No. 207,395 to Corthell, but in that cutter each blade is flat on top and its front face is molded, the
315 cutting edge being formed by the intersection of the flat top and molded front face, and the ride corresponding to ridge 1 of my cutter is across the front face of the blade, or nearly radial, instead of across the top *c* of the blade, or nearly circumferential, as in my cutter. The same is true of the ridges corresponding to the ridges 2 of my cutter. When the ridge 1 is at one side of the front

face, as in Corthell's cutter, the height of the projection above its base is limited by the necessary closeness together of the blades. Moreover, the depth of cut is always less than the height of the projection. The main object of my invention is to provide a sole-edge cutter in which the depth of cut is the same as the height of the projection and in which the height of the projection is not limited by the closeness together of the blades. I am also aware of the patents to Brown and Harrington above mentioned, but both those cutters are wholly unsuited for trimming sole edges, and both lack the ridge 1 at one side of the top surface of the blade for taking out the rand, and also lack the ridges 2 2 for beading the sole edge. I disclaim, therefore, all that is shown in either of the above-named patents.

What I claim as my invention is—

1. A rotary cutter for trimming sole edges, the blades *d* of which are provided with flat front faces *a*, and have their outer or peripheral ends *c* molded throughout to a uniform shape, the converse of the desired shape to be given to the sole edge, and slightly eccentric to the axis of the cutter, substantially as described.

2. A rotary cutter for trimming sole edges, the blades *d* of which are each provided with a flat front face, *a*, and a slightly eccentric cutter or peripheral end, *c*, having formed thereon the end ridges 1 and 2, extending circumferentially across said face, substantially as and for the purposes described.

Executed at Boston, Massachusetts, this 2d day of January, A. D. 1879.

WILLIAM D. ORCUTT.

Witnesses:
N. C. LOMBARD.
C. H. DODD.

1879.

316 & 317 *Contents.*

Application papers.
1. 1 Jan'y 15, 1879.
2. Att'y's letter, Jan. 22, '79.
3. 1 Jan'y 27, "
4. Am'd't Feb. 7, 1879.
5. 2 " 10, "
6. Am'd't Feb'y 19, 1879.
7. 1 " 20, "
7½ Am'd't May 28, 1879.
8. 11 May 28, "
9. Am'd't Jan'y 6, 1881.
10. 1 " 8, "
11. Am'd't Jan'y 18, 1881.
12. 1 " 20, "
13. Am'd't Jan'y 24, 1881.

Title: Improvement in rotary cutters for trimming the edges of boot and shoe soles.

12 boots and shoes.

Ex'd: E. A. M.; H. M. H.

319 UNITED STATES PATENT OFFICE.

WILLIAM D. ORCUTT, of Boston, Massachusetts.

Rotary Cutter for Trimming the Edges of Boot and Shoe Soles.

Specification forming part of Letters Patent No. 238,303, dated March 1, 1881; application filed January 6, 1879.

To all whom it may concern:

Be it known that I, William D. Orcutt, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in rotary cutters for trimming the edges of boot and shoe soles, of which the following, taken in connection with the accompanying drawings, is a specification.

(Here follows diagram marked p. 318.)

My invention relates to that class of rotary cutters consisting of a series of cutting-blades arranged about a common hub; and it consists in certain peculiarities of construction of the blades, more fully described below.

Figure 1 is a perspective view of one form of rotary cutter embodying my invention. Figs. 2 and 3 are perspective views (enlarged for greater clearness) of the upper portion of one of the blades. Fig. 4 is a cross-section, enlarged, illustrating my improved cutter as used.

The blades *d* of my improved cutter have a flat front face, *a*, a flat rear face, *b*, and a top surface, *c*. A number of ridges, 1 2, extend across this top surface or circumferentially of the cutter, making what is called a "molded" or "fancy" surface, which is the converse of the sole-edge desired, every ridge 2 2 making a corresponding depression in the sole-edge, the ridge 1 at the side of the cutter, and when in use next the rand-guide takes out the rand or welt.

The main feature of my invention consists in the blade thus formed with a flat front face and a molded or fancy top surface the converse of the sole-edge, and having the ridge 1 or the ridges 2 2, either or both extending across its top surface—that is, extending from front to back, as shown in the drawings, my improved cutter having a series of such blades, the cutting-edges of each blade extending to one side of the cutter to adapt it for use on the edge of the sole next the upper, and each cutting-edge having the same relation with the axis as all the others. Each blade *d* is shown in this instance as a distinct piece secured to a hub, *d'*, substantially as in United States patent No. 82402, to Harrington, dated September 22, 1868. My invention, however, does not relate to the mode or process of manufacture, but to the article of manufacture; and the blades and hub may be in one piece and constructed by any suitable mode or process too well known to need description, and I disclaim, as any part of my invention, both the cutters and both the modes of manufacture described in the patent to Harrington above named, and in the patent to Brown, No. 45294, dated November 29, 1864.

318

W. D. ORCUTT.

Rotary Cutter for Trimming the Edges of Boot and Shoe Soles.

No. 238,303. Patented March 1, 1881.

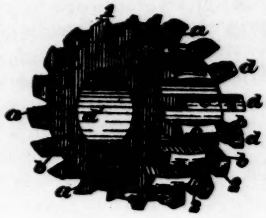

Fig 1.

Fig 2.

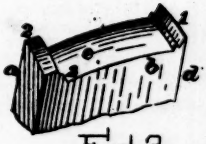

Fig 3.

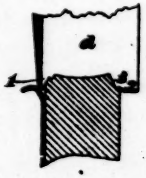

Fig 4.

Witnesses:
E. A. Hammenway
Walter C. Lombard.

Inventor:
William D. Orcutt
by N. C. Lombard
Attorney.

The flat front faces, *a*, of the blades are not radial, but are so inclined as to make each blade slightly hooking, and thereby form a knife-edge at the intersection of the flat front face with the top surface, *c*, and its ridges 1 2 2. This is very desirable, for if the front faces, *a*, be not so inclined the tool will be a scraper rather than a rotary cutter.

The blades are made quite thick from front to rear, so that they may be ground back as they become dulled, and they are ground only on their front faces, *a*, these faces being always maintained at substantially the same pitch. The grinding is done with a flat grinding-surface, (the flat side of a small emery-wheel,) and does not alter at all the shape of the cutting-edge of the blades. The tops *c* and ridges 1 2 2 are inclined rearward to give the necessary clearance, as will be well understood.

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320 one side of the top surface of the blade for taking out the rand, and also lack the ridges 2 2 for beading the sole-edge. I disclaim, therefore, all that is shown in either of the above-named patents.

What I claim as my invention is—

1. A rotary cutter for trimming sole-edges, the blades *d* of which are provided with flat front faces, *a*, and have their outer or peripheral ends, *c*, molded throughout to a uniform shape, the converse of the desired shape to be given to the sole-edge, and slightly eccentric to the axis of the cutter, substantially as described.

2. A rotary cutter for trimming sole-edges, the blades *d* of which are each provided with a flat front face, *a*, and a slightly eccentric outer or peripheral end, *c*, having formed thereon the end ridges, 1 and 2, extending circumferentially across said face, substantially as and for the purposes described.

Executed at Boston, Massachusetts, this 2d day of January, A. D. 1879.

WILLIAM D. ORCUTT.

Witnesses:
N. C. LOMBARD.
C. H. DODD.

321 *Evidence for Complainants in Reply.*

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, Wilmarth H. Thurston, special examiner.

PROVIDENCE, *June* 16, 1885.

Present: J. A. Maynadier, Esq., of counsel for complainants; T. W. Porter, Esq., of counsel for defendants.

Deposition of Oscar J. Beale.

Direct examination by Mr. MAYNADIER:

Int. 1. What is your name, age, residence, and occupation?

Ans. Oscar J. Beale; 42 years; residence, Providence, R. I.; occupation, machinist.

Int. 2. What experience have you had in the manufacture and use of rotary cutters?

Ans. I was five years in charge of the department at Brown & Sharpe's. I was connected with it for several years before that.

322 Int 3. Please look at the articles now shown you and state what you know about them.

The articles referred to are now put in evidence as Complainants' Exhibits Bar 9: Cutter 9 S 62, Brown & Sharpe, and 9 S 62, F. M. S. & Co.; Bar 4: Cutter 4 S 80, Brown & Sharpe, and 4 S 80, F. M. S. & Co.; Bar 2 S 90: Cutter 2 S 90, Brown & Sharpe, and 2 S 90, F. M. S. & Co.; Bar 12 S 56: Cutter 12 S 56, Brown & Sharpe, and 12 S 56, F. M. S. & Co.)

Ans. Experiments were made on Brown & Sharpe's large universal milling machine; speed, 90 revolutions per minute; feed of table, $2\frac{3}{8}$ inches per minute; Bessemer steel bar No. 9. Brown & Sharpe cutter No. 9 S 62 cut $\frac{1}{4}$ inch deep for a distance of $7\frac{1}{2}$ inches on this bar; the Stevens cutter No. 9 S 62 broke in the $\frac{1}{4}$-inch cut in going about three inches. It was the same feed as the other.

The second experiment was with Brown & Sharpe's cutter 4 S 80 and with Stevens' cutter 4 S 80 on bar 4 of Bessemer steel. The Brown & Sharpe cutter cut two-thirds the length of the bar; the Stevens cutter broke at the start. Speed, 90 revolutions per minute; feed, $2\frac{3}{8}$ inches per minute.

The third experiment was with the speed at 90 revolutions a minute; feed, $1\frac{1}{2}$ inches per minute; Brown & Sharpe cutter 2 S 90, Stevens cutter 2 S 90, and bar 2 S 90. We attempted to cut $\frac{1}{4}$ inch deep with the Stevens cutter. Every tool broke before cutting one inch in length. The feed of the Brown & Sharpe cutter was increased to 3 inches per minute. It was entirely successful in cutting about 8 inches.

The fourth experiment was with Brown & Sharpe cutter 12 S 56, feed 3 inches per minute; Stevens cutter 12 S 56, feed $1\frac{1}{2}$ inches per

minute, and bar 12 S 56. The Brown & Sharpe cutter cut $\frac{1}{4}$ inch deep; the Stevens cutter cut $\frac{1}{8}$ inch deep. The Brown & Sharpe cutter was entirely successful; the Stevens cutter had six teeth broken in cutting less than $1\frac{7}{8}$ inches. The speed in this experiment was the same—90 revolutions per minute.

Int. 4. When were these tests made, and where, and who were present?

Ans. They were made June 2, 1885, at the works of the Brown & Sharpe M'f'g Co. Frederick W. Howe, A. E. Tenney, James
323 Anthony, O. J. Beale, Charles H. Phillips, and Mr. Noble and J. A. Coleman were present, and the machinist who ran the machine, whose name is Damon.

Int. 5. Please look at these cutters—defendants' cutter S 80, C. H. Brown's milling-cutter, C. H. Brown's milling-cutter No. 2, Young cutter, Eppler cutter, Stephenson cutter, Stephenson cutter No. 2, Stephenson cutter No. 3, and Colt's armory cutter No. 3—and state which of them, if either, are and which are not practical milling-cutters.

Ans. I should say that those two would cut metal practically. (Witness refers to Stephenson cutter and Colt's armory cutter No. 3.) I shouldn't want to buy any of the other seven as cutters to cut metal with. I should say that they were not practical milling-cutters, as I understand the word.

Int. 6. Where did you get the four pairs of cutters used in the tests as to which you testified?

Ans. I came down as they were about ready to start the machine, and the cutters were already there. I presume they were furnished by Mr. Noble.

Cross-examination by Mr. PORTER:

Cross-int. 7. Are the teeth in the Brown & Sharpe cutters with which you made the experiments upon the exhibit bars of the usual length for milling-cutters—that is, are the spaces between the teeth cut to the usual depth as in Brown & Sharpe milling-cutters?

Ans. Some latitude is allowed in that matter as a convenience in manufacturing. These are within the limits that we do allow.

Cross-int. 8. Please state, if you can and will, whether the spaces or grooves between the teeth in these cutters are of the average depth in Brown & Sharpe milling-cutters of the same or similar diameter.

Ans. Yes, sir.

Cross-int. 9. Do you know why it was that the Stevens cutters selected for this experiment were all of the kind having teeth undercut upon the front face instead of having the front and rear faces of the teeth nearly parallel, as in Exhibits Stephenson Cutters Nos. 2 and 3 and Eppler Cutter?

Ans. I don't know why it was, because I didn't know that
324 any distinction was made between the cutters. What I mean is that I didn't know there was any difference in the cutters.

Cross-int. 10. Please state whether or not the depth of cut made

by the cutters, as stated by you, is an ordinary or usual cut in working metal of this kind with rotary cutters for practical purposes.

Ans. Yes, sir.

Cross-int. 11. With the varieties of sizes of bars to select from, as now furnished by rolling mills and steel mills, and the facilities for forging, do you think it would be usual or common to waste one-fourth of an inch of steel in giving it shape in practical manufacture?

Ans. It is not common to waste the steel if it can be avoided. The term waste is relative, of course. In cutting wrought-steel gears we might cut much deeper than ¼ of an inch. We don't call it a waste of steel, because we would think this the cheapest way to remove it.

Cross-int. 12. What difficulties or defects in point of strength did you find in the Stevens cutters except strength at the base of the teeth?

Ans. The small lip gave away in some cases.

Cross-int. 13. In what cases?

Ans. In the case of No. 9 S 62 and No. 2 S 90.

Cross-int. 14. Take 9 S 62, and state how many teeth are so injured and what is their position in relation to the gap left by breaking out a tooth.

Ans. There are two teeth following or after the gap.

Cross-int. 15. Would not the teeth next after a broken one have an additional duty to perform and be subjected to additional strain by reason of the metal left which would have been cut had the broken tooth performed its duty?

Ans. Evidently they would in a cutter of normal condition.

Cross-int. 16. Might not these two teeth have been broken by contact with the broken tooth which preceded them and which was harder than the steel bar?

Ans. The first one might have been so broken, but the second one evidently was not so broken, because the first tooth could not have got by the broken tooth so as to have presented the second tooth to the broken one.

325 Cross-int. 17. How many were broken at the thin lip in Stevens' cutter 2 S 90?

Ans. One.

Cross-int. 18. And at the time of breaking this one all the teeth were broken from the cutter, were they not?

Ans. I could not tell when it became broken.

Cross-int. 19. At what point in the length of the bar was cutter 2 S 90 cutting when the teeth were broken from the hub as it now appears?

Ans. It was after having cut about $\frac{7}{16}$ of an inch the full depth.

Cross-int. 20. Was it working in its cut when the teeth were broken?

Ans. Yes, sir.

Cross-int. 21. Was cutter 9 S 62 working in its regular cut in bar 9 when its tooth was broken?

Ans. Yes, sir.

Cross-int. 22. Was cutter 4 S 80 working in its regular cut in bar 4 when the teeth were broken from it?

Ans. It had not cut the full depth attempted. It broke at the start.

Cross-int. 23. Was the cutter 12 S 56 working in its regular cut in bar 12 S 56 when the teeth were broken?

Ans. Yes, sir.

Cross-int. 24. Please explain why it is that in each of the bars except 2 S 90 the chip or cut that the cutter was carrying remains on the bar distinct and plain, although but a portion of the teeth are broken out, while in bar 2 S 90, where all the teeth left the hub, the chip or cut has disappeared.

Ans. When we saw the teeth breaking in some cases we stopped the feed and quickly withdrew the work or run it back.

Cross-int. 25. Your answer does not meet the question. It must be obvious to you that in the case of 2 S 90 the cutter remained in contact with the bar until all the teeth were broken from the hub, and to break them there must have been a chip or metal of the bar in front of them resisting their rotation, and that metal must have resisted until all the teeth gave away. Now, if the cutter was working in the arc of the circle which it cuts upon the bar, please
326 explain where are the chips which broke the teeth of the cutter, as is apparent in the other three bars.

Ans. The bar 2 S 90 shows a place where teeth caught. No doubt the teeth following the first broken tooth may have been broken for the same reason as given in cross-int. 16.

Cross-int. 26. Is your last answer the only reason you can give why the chip has disappeared from bar 2 S 90, when it remains upon all the other bars where the teeth commenced to break? If you have any other reason please state it.

Ans. The cutter succeeded in removing such chips as are not on the bar.

Cross-int. 27. Are there any chips on the bar in the curve in which the cutter was acting when last operating upon the bar, and are not the chips perfectly obvious and plain, standing up like a burr on the other bars?

Ans. There is a mark upon the bar 2 S 90 where the cutter may have caught and the chip been removed afterwards by the next teeth coming around. The chip that did stick up may have been knocked off in that rough way which you see. To the last part of the question I answer, Yes, sir.

Cross-int. 28. In giving your testimony thus far, in so far as it relates to which exhibit cutters were used to mill the respective bars, the table speed, rotary speed, and other data of the experiments, you have given them from a memorandum, have you not?

Ans. Yes, sir.

Cross-int. 29. By whom was that memorandum prepared?

Ans. This one was copied by the clerk from the original minutes, and this one is what I subscribed to.

Cross-int. 30. Were you present at all, or what portion, of the experiments as to which you have testified?

Ans. I was present at all of the experiments to which I testified.

Cross-int. 31. Were not the experiments commenced before you were present?

Ans. The cutters were at the machine, but the machine was not started.

Cross-int. 32. Suppose the Stevens cutters with which you experimented had been made with the same strength of teeth at the
327 base as are Defendants' Exhibits Young Cutter, Eppler Cutter, and Stephenson Cutters 2 and 3, do you think there would have been any difficulty in carrying the cut shown in the exhibit bars?

Ans. I could not tell how strong these are without trying them.

Cross-int. 33. In view of what the experimental Stevens cutters did perform before breaking, and the difference in strength at the base of the teeth in those cutters, and the Young, Eppler, and Stephenson cutters, and supposing these last to be well made, of good stock, and properly tempered, would they or not, in your opinion, carry the cut shown in the exhibit bars?

Ans. I think they would have carried it as far as the Stevens cutters did.

Cross-int. 34. And no farther?

Ans. I should think they would cut farther before the body of teeth broke.

Cross-int. 35. Why do you think the experimental Stevens cutters are undercut upon the front face of the teeth?

Ans. I think it was done for cutting leather.

Cross-int. 36. Can you see no other reason? If yea, please state it.

Ans. I see no practical reason. It may have been done for grinding.

OSCAR J. BEALE.

Attest: WILMARTH H. THURSTON,
Special Examiner.

Deposition of James H. Anthony.

Direct examination by Mr. MAYNADIER:

Int. 1. What is your name, age, residence, and occupation?

Ans. James H. Anthony; age, 44; residence, Providence, R. I.; occupation, machinist by trade.

Int. 2. What experience have you had in the manufacture and use of rotary cutters?

Ans. I have been connected with an establishment where they have been used for nearly twenty-three years. I commenced as a tool-maker, and worked upon cutters and other tools for seven
328 years, and then went in as assistant superintendent of the works; held that position two years, and have been superintendent ever since, for fourteen years. The concern was the Provi-

dence Tool Company from 1862 to 1882, and since 1882 it has been the Household Sewing Machine Company.

Int. 3. About what portion of the work done by the Household sewing-machine requires the use of milling tools?

Ans. I should think about half of it in the branch that I am in—the iron work.

Int. 4. About how many styles of cutting edge are used?

Ans. I should think there were over a hundred.

Int. 5. Please look at the four bars and the four pairs of cutters now shown you and say what you know about them.

(The exhibits referred to are those testified about by Beale.)

Ans. I should say those were the bars that cutters were tested upon on the second day of this month at Brown & Sharpe's in my presence, and these are the cutters that were used at that test.

Int. 6. What was done with those bars and cutters after the test was concluded?

Ans. They were marked, the cutters attached to them, and placed in the hands of Mr. O. J. Beale, there to remain until called for.

Int. 7. Are the Stevens cutters, such as were used in that test, practical milling-cutters or not, in your judgment? Please give your reasons for your opinion.

(Objected to as immaterial and irrelevant.)

Ans. For milling some material I should say yes; for others, no. My reasons for their being practical on certain materials, such as wood or any soft material of the nature of wood, are that the teeth are sharp and rank and strong enough for milling that class of material. For milling steel they are not practical. They are too slim at the base and too sharp and rank. I have no doubt but that they would mill a very light cut on steel in limited quantity.

Int. 8. Please look at these nine cutters and state which of them, if either, are practical for milling metal and which are not practical.

(The cutters referred to are those mentioned in Int. 5 to Beale.)

Ans. Those two I should select as practical milling-cutters.
329 (Witness refers to Colt's armory cutter No. 3 and to Stephenson cutter.) The other seven I should not select for milling metal.

Int. 9. Did you ever see either of the nine before the last question was put?

Ans. Not to my knowledge.

Cross-examination by Mr. PORTER:

Cross-int. 10. What practical difficulties do you discover in using the seven cutters for milling metal, which you think are not suitable for that purpose? Please state fully your reasons.

Ans. A weak tooth; the cutter requires too much grinding. Those are the principal reasons. Not so much clearance as I should

have for a cutter back of the tooth to let the chips out. The chips would wedge into a tooth of that form.

Cross-int. 11. What do you wish to be understood as "clearance?"

Ans. From the front edge of one tooth to the back side of the next tooth the distance is too short, the space between the teeth, the space for the chips.

Cross-int. 12. Do you mean in your last answer "from the front edge of one tooth to the back side of the next tooth," or do you mean from the back side of one tooth to the front side of the next as constituting the clearance or chip space?

Ans. I mean from the front side of one tooth to the back side of the next tooth in front—the chip clearance.

Cross-int. 13. What part of the tooth do you refer to in your answer to cross-int. 10 as being "weak?"

Ans. The root.

Cross-int. 14. What part of the tooth do you refer to as the "root?"

Ans. The base.

Cross-int. 15. Have you ever seen cutters tested for milling metal which had the strength of tooth at the base that is shown in these seven exhibit cutters?

Ans. I have never seen just those cutters. I have seen cutters used for milling metal, as near as I can judge by the eye, the same strength at the base of the tooth as those, but a very much shorter tooth.

330 Cross-int. 16. Do you know why the four Stevens cutters selected for milling those exhibit bars of which you have testified were all of the kind having the teeth undercut at the base—that is, thinner at the base than at the top—instead of using cutters which had teeth of practically a uniform thickness from the crown to the base, like the seven exhibit cutters of which you have spoken?

Ans. I know no reason for the selection. I don't remember seeing those others nor any like them.

Cross-int. 17. What is your opinion? Would any of these seven exhibit cutters carry the cut across the exhibit bars which is shown on them with the table feed and rotary speed employed in milling the bars?

Ans. I don't think they would, either of them.

Cross-int. 18. Where do you think they would give way in such case?

Ans. They would break at the root of the tooth.

Cross-it. 19. Do you see any other difficulty in the way of their performing that duty? If so, please state it.

Ans. What I would term the thin lip on one edge here, I think, would give way next. It would be like milling with a case-knife. I have stated before that the teeth would clog, fill up. There is no part of a metal milling-cutter in that that I can see.

Cross-int. 20. Do you or not think that the thin lip, as you term it, would give way in milling the cut across the exhibit bars?

Ans. I think it would unless nursed across.

Cross-int. 21. Do you think that thin lip would mill its depth in a good quality of Jessop's tool steel?

Ans. At a limited speed and feed it would do so, I think.

Cross-int. 22. Would it or not, in your opinion, with the usual speed and feed of metal milling-cutters?

Ans. Do I understand, mill it for any distance?

Cross-int. 23. Do you think it would for any distance; and, if so, how far?

Ans. I think it would give way in less than an inch.

Cross-int. 24. Did any of these thin edges give way in any of these four Steven cutters in milling the exhibit bars except in cases where adjacent teeth were broken out bodily?

331 Ans. I didn't examine them for that purpose.

Cross-int. 25. Upon what practical facts, then, do you base your opinion that this thin edge is not strong enough to mill metal? If you have any such practical facts please state them.

Ans. I give that as my opinion from my experience with generating mills of acute angles and on mills for graduating.

Cross-int. 26. Then your opinion is based upon deductions and not upon practical tests, is it not, so far as these cutters are concerned?

Ans. So far as these are concerned; yes, sir; that is, as far as that little lip is concerned.

Cross-int. 27. You have spoken in a previous answer of these seven exhibit cutters involving too much grinding. Do you mean by that anything more than that there are too many teeth to grind; and, if so, what?

Ans. I mean that in a formed mill less grinding is required if the teeth are cut either radial or forward of the center. It is my practice always to cut ten degrees forward of the center.

Cross-int. 28. Do you mean by "forward of the center" that the tooth is hooking or the reverse of hooking?

Ans. The reverse of hooking; what we should call scraping.

Cross-int. 29. Please state whether or not you think that the Stevens cutter 9 S 62 undercut as it is at the base of the front of the teeth would require more or less grinding than the Brown & Sharpe cutter 9 S 62.

Ans. It would require more.

Cross-int. 30. What do you suppose to be the object of undercutting the teeth as shown in the Stevens cutter referred to in the last question?

Ans. To enable them to cut a soft substance of little tenacity, such as wood and perhaps leather. I have made cutters like that for wood, gunstocks.

Cross-int. 31. How many degrees from a radial line should you judge the operative portion of the front face of the teeth in this Stevens cutter 9 S 62 to be?

Ans. About eight degrees, I should say.

Cross-int. 32. Are there or not two angles or portions to
332 the front face of these teeth, an upper one which is inclined, as you say, about eight degrees from a radial line, and the
Ar ther one much more inclined, which undercuts and reduces the

thickness of the tooth at its base? If this be so please state what, in your opinion, is the object of thus undercutting the tooth?

Ans. The front of the tooth is a broken line—that is, it takes two directions to get to the bottom of the tooth from the cutting surface. The change in the direction of the undercut at the lower part or base of the tooth is to enable you to get depth to hold the shavings. This makes a stronger tooth than it would be if it kept the same width. It makes a tooth more lasting for the purpose for which it is intended, because the root of the tooth is nearer the periphery of the cutter, and also clears away the metal at the root of the tooth, so there would be less to grind.

Cross-int. 33. If your last answer be correct in that the cutting away at the bottom of the front of the tooth causes less grinding, how do you explain your answer to cross-int. 29 in which you state in substance that the Stevens cutter 9 S 62 would require more grinding than the Brown & Sharpe cutter with the some mark?

Ans. The Stevens cutter requires the most grinding, as I stated before, but by cutting under, being permissible for the purpose it is intended for, there is less metal to grind away than there would be if the face of the tooth were a straight line to its depth.

Cross-int. 34. Please state whether or not you consider that there is any material difference in any practical sense as judged by mechanics between the four experimental Stevens cutters and the Eppler cutter and the six other exhibits similar to it; and, if so, state wherein such difference, in your opinion, exists.

Ans. There is a slight difference in the strength of the tooth, the Stevens cutter being the weaker of the two.

Cross-int. 35. Do you see any other practical difference?

Ans. As far as the form of the periphery is concerned, they are different. Otherwise they are of the same general plan.

Cross-int. 36. You have spoken of forming similar cutters for gunstocks and other wood work. Please state when and where it was.

Ans. At the Providence Tool Company I followed designs
333 given me from 1862 to 1865, and also at the Providence Tool Company I designed such cutters from 1873 to 1878.

Cross-int. 37. Judging from your experience with previous cutters, would or not these exhibits Stevens cutters and the seven other exhibits of which you have spoken perform good work in cutting or shaping wood?

Ans. They would perform work, but not perfect work; they are not as sharp as I should make them for wood work.

Cross-int. 38. You spoke in one of your answers of the rankness of teeth. Do you mean by that what is termed hooking, or what do you wish to be understood by that term?

Ans. What I term a rank tooth is one that will dig or lift. It i a hooking tooth.

Cross-int. 39. The matter of giving teeth more or less rake, a cording to the duty they are to perform, has long been well unde stood by those skilled in rotary cutters, has it not?

Ans. It has.

Cross-int. 40. How would the rake in those cutters made by you at the Providence Tool Co. for shaping wood, as stated by you, compare with the Exhibit Eppler Cutter and the Exhibits Experimental Stevens Cutters—that is, was the rake more or less in those cutters than in these?

Ans. Usually more.

Cross-int. 41. Do you consider the teeth in the exhibits Stevens cutters an unusual or peculiar tooth in any respect; and, if so, in what respect?

Ans. I do. The Stevens cutter is what is known as the Brown & Sharpe cutter, with a peculiar form upon its periphery, and its hooking tooth of that form and that depth, a very unusual depth, makes it an unusual tooth.

Cross-int. 42. Please examine the drawings in patent to W. D. Orcutt, No. 212,971, dated March 4, 1879, and state whether or not there is any peculiarity found by you in the Stevens cutter that is not shown in the drawings of that patent. In answering this question please examine the drawings carefully and make measurements, if you shall see fit, having due regard to the scale or relative size of the drawings and the cutter.

334 Ans. As far as the teeth are concerned, I see no difference in the form of the tooth.

(Adjourned to Friday, June 19, 1885, at 10 a. m.)

PROVIDENCE, *June* 19, 1885.

Present: Counsel as before.

Redirect examination by Mr. MAYNADIER:

Int. 43. In your 32nd answer you seem to speak of cutting away a part of the lower part or base of the tooth as making it stronger. Please explain your meaning.

Ans. I can't explain unless I write that answer over again. It leaves the root of the tooth on a larger circle. The other answer practically says so.

Int. 44. In your 38th answer you speak of rankness. Please state what the effect would be in cutters of this kind, supposing the front face of the tooth was very much more inclined to the radius—that is, a tool made excessively hooking—and supposing also that the top surface of the tooth was on a true circle from the center of the cutter.

(Objected to as immaterial and as propounding a theory which has no relation to this case and about a matter concerning which it does not appear that this witness has had any experience, and, further, the question is not confined to the effect upon the cutter in working upon any specified material.)

(In view of the objection the following is added to the question:)

That is to say, please explain a little more fully as to rankness, and in particular how it is affected by the degree of inclination of the front face of the tooth to the radius of the cutter when consid-

ered in connection with the backing off of the top surface of the tooth.

(Same objection as to the first installment of the question.)

Ans. This seems to me to be two questions. The first question is what would be the effect upon the cutter if cut exceedingly hooking with no clearance on the top of the tooth, to which I will answer that such a cutter would not cut theoretically, but practically the spring in the arbor or vise holding the piece to be cut would
335 allow it to take a limited chip. Of course, it is understood that it is not so far undercut as to have no strength. The next question the conditions are the same, except the clearance of the tooth. Of course, this last would cut if it was of sufficient strength.

My explanation of a rank tooth is one that will dig or tear if the metal is of sufficient tenacity, its tendency being to bury itself in the metal and when working wood or soft material its tendency is to shave. It will leave hard substances or hard surfaces chattered, while if the face of the tooth is cut on a radial line or front of such line, it will mill smooth and keep the work or the piece to be milled down upon its bed. I have often seen a hooking tooth or rank tooth cutter pick the work out of the vise or take up the back lash of the carriage. Such a thing I never saw with a cutter with its face cut on a radial line or forward of it.

Recross-examination by Mr. PORTER:

Cross-int. 45. In previous answers you have applied the term "clearance" to the spaces between the teeth. Do you intend to be understood in your last answer, where you speak of clearance, as applying it to such spaces, or do you apply it to the eccentricity of the peripheral face of the tooth?

Ans. I think in my previous answers I used the term chip clearance, which applies to the spaces between the teeth. In this case perhaps I should have said backing off, which would have been the eccentricity of the outer part of the tooth.

Cross-int. 46. In view of your answer to R. D. Int. 44 it would seem that if a cutter milled metal smooth and well that its teeth have the proper rake upon the front face. Is this so or not?

Ans. I should say they did.

Cross-int. 47. During the last fifteen or twenty years has or not great attention been given to and improvements made in the matter of rotary cutting tools? And in this last term I included fluted reamers, screw-cutting taps, and the various rotary cutting tools which are driven upon an arbor.

Ans. There has been.

Cross-int. 48. The method of inclining, or the inclination
336 of the front face of the teeth of rotary cutting tools so as t produce good results, has been well understood for man years, have they not?

Ans. Yes, sir.

Cross-int. 49. A man skilled as yourself in the production of great

varieties of cutters can readily determine in any given case for performing any given job the proper diameter of a cutter, the proper number of teeth, the proper depth of slot between the teeth, and the proper inclination of the front face of the teeth relative to a radial line, as also the proper backing off or clearance upon the periphery of the teeth, can he not?

Ans. Yes. There are materials I am not skilled on. I never milled a great deal of gold.

JAMES H. ANTHONY.

Attest: WILMARTH H. THURSTON,
Special Examiner.

Deposition of Charles H. Phillips.

Direct examination by Mr. MAYNADIER:

Int. 1. What is your name, age, residence, and occupation?

Ans. Charles H. Phillips; age, 52; residence, Providence, R. I.; occupation, machinist.

Int. 2. What experience have you had in the manufacture and use of milling-cutters?

Ans. I have been connected with the making and use of milling-cutters since 1861, with the Providence Tool Co., the Burnside Rifle Co., and the Brown & Sharpe M'f'g Co., all in Providence.

Int. 3. Please look at the four metal bars and the four pairs of cutters now shown you and state what you know about them.

(The exhibits referred to are those put in evidence after Int. 3 to Oscar J. Beale.)

Ans. I should judge from their general appearance that they are the four bars that were milled in my presence at the Brown & Sharpe M'f'g Co., and that the cutters attached are the cutters that were used.

Int. 4. When was this and who were present?

337 Ans. To the best of my knowledge, it was June 2, 1885. Specially present were Mr. Tenney, Mr. Frederick Howe, Mr. James Anthony, Mr. Oscar J. Beale, and Mr. John Coleman, and Mr. Noble were there.

Int. 5. Please look at the ten cutters now shown you and state which of them are and which are not practical milling-cutters.

(Exhibits referred to are the nine mentioned in Int. 5 to Beale and Defendants' Exhibit Howell Cutter.)

(Question is objected to as leading in assuming that there are, among the cutters inquired about, some cutters which are practical and others which are not practical as milling-cutters.)

Ans. I find among these cutters but two which I should consider in practice as milling-cutters in the usual acceptation of the term.

(Witness refers to Exhibit Stephenson Cutter and to Exhibit Colt's Armory Cutter No. 3.)

Int. 6. Did you make or cause to be made any memoranda showing the particulars of the tests at Brown & Sharp's on the 2nd of June? If so, will you please give your copy of this memoranda to the magistrate for use as a part of your deposition and state whether the statements contained in the memoranda are true or not?

(Introduction of memorandum objected to unless the witness will testify that he knows that it is a true record of the facts connected with the experiments of which it purports to be a transcript of record.)

Ans. I am personally knowing to this memoranda being made and believe it to be correct in all particulars.

(The memorandum referred to in the preceding question and answer is as follows:)

"*Experiments with Brown & Sharpe & Stevens Cutters, June 2nd,* 1885, 1 *P. M.*

Present: Mr. Fred. W. Howe, Mr. A. E. Tenney, Mr. Jas. Anthony, Mr. O. J. Beal, Mr. Chas. H. Phillips.

Machine in which cutters were tried: Brown & Sharpe universal mill mach. (large size).

1st experiment:

Speed of cutters, 90 revolutions per minute.
338 Feed of table, 2¾ in. per minute.
Bar attached to cutters No. 9, Bessemer steel.

Brown & Sharpe cutter No. 9, S 62, cut ¼ in. C. H. P. deep in annealed steel bar.

Stevens cutter No. 9, S 62, broke on ¼-in-cut.

2nd experiment:

Brown & Sharpe cutter No. 4, S 80.
Stevens cutter No. 4, S 80.
Bessemer steel bar No. 4.

The cutter was first run upon the bar to the depth of the teeth and then a quarter-inch cut was attempted.

Brown & Sharpe cutter cut ¾ length of bar.

Stevens cutter broke at the start.

3rd experiment:

Speed, 90 revolutions per minute.
Feed, 1½ inches per minute.
Brown & Sharpe cutter No. 2, S 90.
Stevens cutter No. 2, S 90.
Bar No. 2, S 90.

The feed for Stevens cutter was reduced from 2¾ in. to 1½ in. pe minute. Cut attempted was ¼ in. deep. Every tooth broke off be fore the cutter had gone one inch. Brown & Sharpe cutter, with feed

increased to 3 inches per minute, was entirely successful. Cut about 9 inches.

4th experiment:

Brown & Sharpe cutter No. 12, S 56, cut $\frac{1}{4}$ in. deep; feed, 3 in. per minute.

Stevens cutter No. 12, S 56, cut $\frac{1}{8}$ in. deep; feed, $1\frac{1}{2}$ in. per minute.

Brown & Sharp cutter was entirely successful.

Stevens cutter broke 6 teeth out at $1\frac{1}{2}$ in. in length.

Cross-examination by Mr. PORTER:

Cross-int. 7. At whose request did you attend these experiments in milling the exhibit bars?

Ans. Mr. Oscar L. Noble's.

339 Cross-int. 8. What was the object stated to you of making these experiments?

Ans. The object, as I remember it was stated, was to test the practicability of two styles of cutters as milling-cutters, and to discover whether or no they were of the same character.

Cross-int. 9. What were the defects, in your judgment, in the experimental Stevens cutters which were tested upon the exhibit bars as milling-cutters?

Ans. Principally that they were deficient in strength in the tooth and had excessive clearance.

Cross-int. 10. Please state more particularly the location of the lack of strength in the teeth, as spoken of by you in your last answer.

Ans. At the root of the tooth.

Cross-int. 11. Any other deficiency in strength that was developed at that test?

Ans. It was general construction—general shape of the tooth—being long, slender, and not having the support requisite for an ordinary milling-cutter.

Cross-int. 12. Do you know why it was that none of the cutters like Exhibit Young Cutter and Howell Cutter were used at that test?

Ans. I do not.

Cross-int. 13. If it were common to make cutters both like the experimental Stevens cutters and like the Exhibit Young and Howell Cutters, and you wished to give a fair test to that class of cutters, which do you think would be the fairer test, to experiment only on cutters which had teeth weak at the base like the experimental Stevens cutters or to experiment with both kinds?

Ans. If I wished to ascertain the relative strength of the three kinds of cutters, then I should want to test the three kinds.

Cross-int. 14. Judging by what milling was done by the experimental Stevens cutters and their relative strength at the base of the teeth as compared with the Young and Howell cutters and the Exhibit Eppler Cutter, what is your opinion—would or not these three last-named cutters carry the milling cut shown upon the exhibit bars?

Ans. I do not think they would, although apparently stronger than the Stevens cutters.

Cross-int. 15. Do you think either the Young, Eppler, or
340 Howell cutters would mill in wrought iron a channel showing the entire configuration of the molded face—that is, cutting a channel as deep as from the lowest part of the molded face to the highest part, and without injury to the cutter?

Ans. I do not.

Cross-int. 16. Please answer the same question with reference to hard composition, an alloy of copper and tin.

Ans. I do not, without injury to the teeth.

Cross-int. 17. Do you believe it would be practical to make a cutter like either of these three cutters in its form of teeth, rake, and size of teeth that would mill first-quality Jessop's tool steel, carrying a cut as deep as the molded peripheral face of the teeth of the cutter?

Ans. I should not consider a cutter made like these a practical cutter for that purpose.

Cross-int. 18. Your answer does not meet the question, which is, in effect, whether, in view of your experience, you believe it would be practical to make a cutter exactly like these three exhibits in form and proportion that would mill first-class Jessop's tool steel, carrying a cut as deep as its molded face?

Ans. I do not, without injury to the steel.

Cross-int. 19. Do you believe that either of the eight exhibit cutters which you have selected as not being milling-cutters will mill cast iron practically at the usual table feed and rotary speed of cutter and perform a good, smooth cut as deep as the molded face of the cutter?

Ans. I do not.

Cross-int. 20. Please point out fully and clearly all the defects or characteristics, mechanically speaking, which you find in these eight cutters that unfit them for milling-cutters.

Ans. I shouldn't be able to point out all the defects.

Cross-int. 21. Please point out as many as you can.

Ans. As I have already stated, the main objections are the shape, depth, and strength of the teeth and the amount of clearance.

Cross-int. 22. As the term "clearance" is differently applied by different persons, please explain what you mean by clearance.

Ans. By "clearance" I mean the amount of stock removed from the periphery of the tooth back of the cutting edge.

341 Cross-int. 23. And you think these defects or characteristics would disqualify these cutters for milling steel, composition, wrought or cast iron, as you have stated?

Ans. I do, practically.

Cross-int. 24. The matter of the rake or relation of the front of the tooth to a radial line for various kinds of work performed by rotary cutters has been well understood for many years, has it not, by those skilled in the use of such cutters?

Ans. Well, I don't know that there is any fixed rule governing those points.

Cross-int. 25. Manufacturers differ in regard to them and for different work, do they not?

Ans. I think they do.

Cross-int. 26. Is or not the same true of the depth of the spaces between the teeth and the number of teeth in cutters of a given diameter?

Ans. Yes; there is a difference with different manufacturers or different men.

C. H. PHILLIPS.

Attest: WILMARTH H. THURSTON,
Special Examiner.

Deposition of Alfred E. Tenney.

Direct examination by Mr. MAYNADIER:

Int. 1. What is your name, age, residence, and occupation?

Ans. Alfred E. Tenney; age, 51; residence, Providence, R. I.; occupation, machinist.

Int. 2. What experience have you had in the manufacture and use of milling-cutters?

Ans. My experience has been with the Providence Tool Co., manufacturing guns and sewing-machines, since 1861, with the exception of about three years in my own shop.

Int. 3. Please look at the four metal bars and the four pairs of cutters now shown you, and say what you know about them.

342 (The exhibits referred to are the same as testified about by Beale, Anthony, and Phillips.)

Ans. These are the bars that we saw the tests made upon with the cutters, I should say, at Brown & Sharpe's, and these are the cutters attached.

Int. 4. Please hear the magistrate read the memorandum produced by Mr. Phillips and state how it differs, if at all, from your memorandum, and also whether the statements contained in it are true or not.

(Question objected to. Comparison of memorandums is incompetent, and all use of memorandum, except to refresh the memory of the witness, it not being competent for him to swear to the truth of the memorandum, as it does not appear that he made it even.)

(Memorandum read to witness.)

Ans. Mine is the same thing in substance, but the wording is somewhat different. The statements contained in the memorandum are true.

Int. 5. Can you estimate with any fair approach to accuracy the difference in strain in the fourth experiment, when the Brown & 3 Sharpe cutter cut $\frac{1}{4}$ inch deep with a 3-inch feed and the Stevens inch deep with $\frac{1}{4}$-inch feed?

o Ans. I should say there was fully four times as much resistance in the one case as in the other.

Ans. I do not think they would, although apparently stronger than the Stevens cutters.

Cross-int. 15. Do you think either the Young, Eppler, or
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Attest: WILMARTH H. THURSTON,
Special Examiner.

Deposition of Alfred E. Tenney.

Direct examination by Mr. MAYNADIER:

Int. 1. What is your name, age, residence, and occupation?

Ans. Alfred E. Tenney; age, 51; residence, Providence, R. I.; occupation, machinist.

Int. 2. What experience have you had in the manufacture and use of milling-cutters?

Ans. My experience has been with the Providence Tool Co., manufacturing guns and sewing-machines, since 1861, with the exception of about three years in my own shop.

Int. 3. Please look at the four metal bars and the four pairs of cutters now shown you, and say what you know about them.

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Ans. I should say there was fully four times as much resistance in the one case as in the other.

Cross-examination by Mr. PORTER:

Cross-int. 6. At the time of making the experiments referred to were any cutters like or similar to those now shown you, being the Exhibits Howell Cutter, Eppler Cutter, and Young Cutter, then before you, or was your attention then called to them in any way?

Ans. No, sir; not exactly like them, when you come to fine points.

Cross-int. 7. What is your opinion, would cutters like these three exhibits successfully and practically mill hard composition (an alloy of copper and tin) carrying a cut as deep as the molded face upon the teeth of these cutters?

Ans. It would carry the cut if you fed it slow enough.

Cross-int. 8. How if the speed was the usual speed in milling such metal and the feed of the table was the same—that is, usual feed?

343 Ans. My opinion is it wouldn't do it practically; it wouldn't be a practical working cutter.

Cross-int. 9. Please answer the same question in reference to cast iron.

Ans. I should answer it in the same way.

Cross-int. 10. What would your answer be in reference to milling wrought iron?

Ans. I should say with wrought iron, if possible, it would be less practical.

Cross-int. 11. Then you do not believe that a cutter like one of these could be made to mill first-class Jessop's tool steel, carrying a cut as deep as the molded face of the teeth, with the usual rotary speed of the cutter and traveling feed of the bed? Is this so or not?

Ans. It wouldn't be practical to mill Jessop's steel that cut with the usual speed and feed.

Cross-int. 12. How far in lineal distance do you think one of these cutters might cut in Jessop's steel in the manner stated before giving out?

Ans. That is a pretty hard question. There are so many things dependent. It might cut six inches and it might cut two feet.

Cross-int. 13. If one of these cutters might cut two feet in first-class tool steel what is your opinion about its carrying the cut on one of these exhibit bars the same distance as the Brown & Sharpe cutter?

Ans. I think it wouldn't do it.

Cross-int. 14. And yet you think it might cut two feet in first-class Jessop's tool steel?

Ans. I think it might possibly.

Cross-int. 15. What, in your opinion, is the relative strength of the teeth in the Exhibit Young Cutter and in the Exhibit Stevens Cutter 12, S 56?

Ans. I should think the Young cutter was nearly or quite double the strength of the Stevens cutter 12, S 56.

Cross-int. 16. Assuming that the two cutters referred to in the last question are both equally well known as Orcutt cutters, and the

question to be determined is whether the Orcutt cutter is adapted to use as a milling-cutter, would you say that it was a fair test
344 of the Orcutt cutter to take the one here marked Stevens cutter for test purposes and not test the one marked Young cutter?

Ans. I should think that would depend on circumstances.

Cross-int. 17. Please reconsider your last answer in view of the fact already stated by you that the Stevens cutter is of about only half the strength of the Young cutter, and state whether you regard it as a fair test of the question of whether this class of cutters are adapted to milling purposes to select the weakest of two kinds instead of testing both the weaker and the stronger, if both are equally well known.

Ans. I should say if the parties owning all of these weak cutters should say that any of their cutters were capable of doing certain milling that it would be fair to try the weaker one.

Cross-int. 18. Suppose they had stated to you that cutters like these Stevens cutters would not mill a certain material, but that cutters like the Young cutter would mill that material, would you deem it a fair test to try the Stevens cutters upon material that you had been told they would not cut?

Ans. No, sir; I shouldn't.

Cross-int. 19. Then, to change the proposition, if you had been told that cutters like the Young cutter were capable of milling metal would you deem it a fair test to attempt to mill the same metal with the Stevens cutters, which you say are only of about half the strength of the Young cutter?

Ans. I should say that if the owners of those cutters said that the Young cutter was capable of milling metal and that the Stevens was not that it wouldn't be fair under those circumstances to attempt to mill with the Stevens cutter.

Cross-int. 20. In the experiments which you witnessed did you discover any other inherent weakness in the Stevens cutters except at the base of the teeth?

Ans. I should say that was a weak spot there. (Witness points to the thin lip at one side of the cutter.) I mean a weak spot for milling metal.

Cross-int. 21. Upon what facts do you base this last conclusion? Please state them fully.

Ans. Upon my experience.

345 Cross-int. 22. Do you know of what metal the Exhibit Stevens Cutters are made? If so, please state.

Ans. I only know from what I have been told.

Cross-int. 23. Please state that and who told you.

Ans. I was told they were made of Bessemer steel. I couldn't say who told me, for I heard it mentioned by two or three different ones.

Cross-int. 24. Is such a tool equal or inferior in strength and endurance to a milling tool made of good cast tool steel?

Ans. I can't say, for I never had any experience in making them of Bessemer steel.

Cross-int. 25. With twenty years' experience are you unable to give an opinion as to the relative strength and endurance of Bessemer steel as compared with cast tool steel?

Ans. I don't think I am unable to give an opinion; but, as I understood it, you asked as to the relative strength and endurance of the two, but not as to my opinion.

Cross-int. 26. Please give such opinion.

Ans. My opinion is that the Bessemer steel would be the tougher of the two.

Cross-int. 27. What is the relative cost of the two?

Ans. Bessemer steel costs about one-fifth as much as best cast steel.

Cross-int. 28. Please state how it happens that you have never used Bessemer steel for any such purpose, in view of its low cost, and at the same time decline to say that it is inferior to the cast steel.

Ans. I do not admit that cast steel is inferior to the Bessemer steel to make cutters for milling metal, but I do say that Bessemer steel is tougher, and therefore better for some purposes. I don't consider Bessemer steel of any value for milling cutters for milling metals, as we can only harden it by a process which we call case-hardening.

Cross-int. 29. In view of your former answer, in which you express the opinion that the thin lip at one side of the Stevens cutters is lacking in suitable strength to mill metal, please examine the four experimental Stevens cutters and state whether you find the thin lip on any of the teeth of those cutters injured, except adjacent to where teeth were broken out bodily.

Ans. I don't find them injured.

346 Cross-int. 30. If you were shown a piece of good hard composition, which was milled smooth and in good workmanlike shape, and were told that it was milled at one cut, at average speed and feed, the depth of the molded face of the cutter, and with a cutter made in all respects like the Exhibits Howell, Eppler, or Young Cutters, would you believe that it was performed with that kind of a tool?

Ans. I should be forced to believe it if a man told me that I had confidence in, nor do I doubt but what it could be done for a foot or two or more, perhaps, but I should hesitate to believe that a man would mill all day on hard bronze or hard metal the depth of the face of the cutter with one cutter. I call that practical work.

Cross-int. 31. If the cutter performed its work for six inches or a foot, what result would transpire, in your opinion, to prevent its continuing to perform its work? And in answering this question please bear in mind that in the experiments witnessed by you at Brown & Sharpe's the Stevens cutters gave way before they had milled more than from a half inch to about two inches and a half.

Ans. The cutter would lose its keen edge, at which time the resistance would be greater. It is the resistance against those teeth that would cause them to give out. There wouldn't be strength enough in them to enable them to stand the resistance against a dull cutter.

Cross-int. 32. Is or not the dulling of the edge an incident common to the use of all cutters, and was it not the facility for sharpening that constituted one of the chief claims to merit in the Brown cutter?

Ans. It certainly is common to all cutters. They will get dull, but the Brown & Sharpe cutter will stand up under dull teeth and not break where these cutters, in my opinion, would give out.

Cross-int. 33. The endurance of the Brown & Sharpe cutter, referred to in your last answer, results in part from the lesser number and consequently greater width of teeth at the base, does it not?

Ans. I should think so.

Cross-int. 34. And the lesser number of teeth there are in a rotary cutter the greater amount of chip must be carried by each tooth with a given feed, must it not?

Ans. Yes; if every tooth cuts in both cases.

Cross-int. 35. And with the sixteen teeth in the Young,
347 & 348 Eppler, and Howell cutters less chip is carried by each than would be by each of the twelve teeth in the Exhibit Brown Cutters, the feed and speed being equal? Is this so or not?

Ans. Yes; if in both cases all the teeth cut.

Cross-int. 36. How long have you known cutters such as are termed the Brown & Sharpe cutter?

Ans. I don't exactly know; more than fifteen years ago, I think.

Cross-int. 37. By whom were the first made that you saw?

Ans. By Brown & Sharpe, I suppose; they came from there.

ALFRED E. TENNEY.

Attest: WILLIAM H. THURSTON,
Special Examiner.

UNITED STATES OF AMERICA, }
District of Rhode Island. }

I, Wilmarth H. Thurston, a special examiner duly appointed by agreement of parties to take testimony under and pursuant to the 67th rule of the Supreme Court of the United States, in equity, as amended, to be used in said cause, which evidence is hereto prefixed, do hereby certify that on the 16th and 19th days of June, 1885, said Oscar J. Beale, James H. Anthony, Charles H. Phillips, and Alfred E. Tenney personally appeared before me at my office, No. 26 Westminster street, in the city of Providence, in said district of Rhode Island, and, being by me first duly cautioned and sworn, did thereupon depose as appears in the foregoing depositions, which were reduced to writing by me in their presence and read over to said witnesses and by them signed as and for their depositions in my presence.

I further certify that I am not of counsel nor attorney for either of the parties in said cause nor in any way interested in the event thereof.

Attest: WILMARTH H. THURSTON,
Special Examiner.

349 *Evidence for Complainants in Reply.*

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, William A. Copeland, special examiner.

BOSTON, *Sept.* 14, 1885.

Present: J. E. Maynadier, Esq., of counsel for complainants; T. W. Porter, Esq., of counsel for defendants.

Deposition of John A. Coleman.

Direct examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Int. 1. What is your name, and have you previously testified in this case?

Ans. John A. Coleman; yes.

Int. 2. Please read the 3d, 4th, and 5th questions and answers of Mr. O. J. Beale, pages 6 and 7 of complainants' evidence in reply, and state what you know as to the tools and exhibits mentioned by him, and also how these tools affected, if at all, your opinion as to the use of sole-edge trimmers as milling tools.

Ans. I witnessed the experiments made by Messrs. Beale, Anthony, and others June 2, 1885, at Brown & Sharpe's, in Providence, and referred to by Mr. Beale in his testimony. Two sets of cutters were tested, one being shoe-trimming cutters and the other being metal milling-cutters having the same peripheral configuration as the shoe-trimming cutters. The shoe-cutters and milling-cutters were tested alternately upon the same bars of metal. Both the milling-cutters and the shoe-trimming cutters were revolved at the same rate of speed, but in most cases the bars were fed to the milling-cutters at a far higher speed than to the shoe-trimming cutters. The result of
350 all these experiments was that the shoe-trimming cutters were completely wrecked immediately or soon after commencing to cut the bars, while the milling-cutters plowed through and did their work in a workmanlike and beautiful manner. The effect of these experiments was to corroborate emphatically the testimony which I have given upon this subject of rotary metal and leather cutting tools which have been the subject of controversy in this case.

Int. 3. Some of defendants' witnesses testify that the tops of the teeth in the rotary sole-edge cutters made by the plaintiffs and defendants do not act as guards to regulate the depth of cut. Please explain as to this, referring to the testimony of Corthell, Int. 29, page 187, Int. 32, page 188; Miles, Int. 15, 16, and 17, page 197; Eppler, Int. 11, page 206; Thompson, Int. 23, page 214; Kingsley, Int. 16, page 192.

Ans. These gentlemen state, if I understand their testimony, that the top of the tooth does not act as a guard to regulate the depth of cut of the tooth, but that any amount of leather can be cut from the

sole by the application of more or less pressure of the sole against the cutter.

The top of the tooth does act as a guard to regulate the thickness of the chip or of the shaving as the tooth passes over the leather, but by leaving the sole in contact with the cutter for a lengthened period of time and applying an increased pressure the tooth, of course, will pass the leather an increased number of times, and will cut an increased number of shavings (the thickness of each one of which will be regulated by the top of the tooth), and, of course, any amount of leather may be cut away by holding it long enough against the cutter.

Int. 4. Please look at Exhibit Bigelow Cutter and compare that with the cutter described in complainants' patent in suit, and also with the hand planes ordinarily made, Exhibit Hand Plane.

Ans. I have examined the hand plane marked Def'ts' Exhibit Bigelow Cutter. There is a handle with a metal bed attached. The bed has an extension upon one side of its front, and this extension is grooved to receive one edge of a molded blade which lies upon the bed of the instrument. The other edge of the blade is in contact with a plate which is screwed upon the side of the metal bed
351 piece in the handle, and the plate serves to hold the molded blade in place and to act also as a rand guard. The forward edge of this plate is blunted or rounded so that it may not cut the upper leather. There is also upon this instrument a detachable metal piece screwed to the bed piece of the instrument to act as a guard and regulate the thickness of the shaving which the molded blade makes. This tool differs mainly from the old hand plane in the method of attaching the blade to the instrument and that it has a rand guard detachable from the blade. The rand guard in this Bigelow hand plane operates the same as the rand guard in the other hand planes.

It differs from the Orcutt cutter from the fact that it is substantially part and parcel of one tooth, while in the Orcutt trimmer the rand guard is continuous and extends from tooth to tooth and cooperates with them to make a safe and practical tool; whereas if a tool should be organized with a series of Bigelow cutters upon the periphery of a cylindrical hub, together with a series of detachable rand guards operating with them, the forward ends would form blunt teeth to tear the upper leather of the shoes.

(Adjourned.)

BOSTON, *Sept.* 15, 1885.

Present: Counsel as before.

Cross-examination by T. W. PORTER, Esq., of counsel for defendants:

Cross-int. 5. Please examine the two cutters marked Compl'nts' Exhibit Busell Cutter (Orcutt patent of '81) and the cutters marked, respectively, Def'ts' Exhibit Eppler Cutter and Def'ts' — C. H. Brown's Milling Cutter and C. H. Brown's Milling Cutter No. 2, Def'ts' Exhibit Howell Cutter, and Def'ts' Exhibit Stephenson Cutter No. 3,

and state whether or not you find any difference in them in so far as they do or do not embody the essential features of complainants' patent.

Ans. I have examined them and they appear to be substantially like the cutters described in complainants' patent. There is one material difference, however, that I observe, namely, that the teeth of the said defendants' exhibits are very much stronger at the base than the Complainants' Exhibit Busell Cutters, and much
352 stronger than shown in the drawings of complainants' patent, making them more like milling-machine cutters in regard to strength, and the teeth in all these defendants' exhibits are shorter and thereby stronger than those of Compl'nts' Exhibit Busell Cutters or than those shown in the drawings of Complainants' Exhibit Orcutt Patent.

Cross-int. 6. Do you regard this difference as anything more than a mere mechanical change of proportions, which any mechanic might readily produce?

Ans. Any mechanic might readily produce the change, but he would be a very poor mechanic if he did it for the purpose of cutting leather, for he produced a tool by this change which presents a greater flat front face of tooth to be ground than is indicated in the Orcutt patent or by the Orcutt tool, and requires just so much more metal to be ground off in sharpening, with the inconveniences and expense consequent thereon.

(All the foregoing answer objected to after the word change, where it first occurs, as being argumentative and entirely uncalled for; and defendants' counsel now gives notice to this witness, both for the purpose of saving time and that the answers may be responsive and only responsive, that he is requested in every answer that he may give to cross-interrogatory not to argue the same or encumber the record with his reasons for his answer unless his reasons are especially requested.)

Cross-int. 7. Are you or not aware that it has been common in years past, both by complainant and defendant, to make and sell cutters having teeth in the form and proportion like those before inquired about?

Ans. I am not aware of that fact.

Cross-int. 8. Are you aware that it was for years common for complainant to form an open slot through the front or rand-lip side of these cutters to receive a rand-cutter like or similar to those shown in cuts numbered 132 and 133, page 29, in Exhibit Compl'nts' Price List?

Ans. I am aware only from hearsay that they ever made cutters of that description.

Cross-int. 9. Please examine the cutter now shown you, marked Def'ts' Exhibit Brown and Sharpe Slotted Cutter, and respond to the two following queries: First, does this cutter appear to have
353 been formed for trimming shoe-sole edges, and does it have a slot apparently adapted to receive a bar rand-cutter like those just inquired about; second, do you discover any material

difference in the proportions of the teeth in this cutter from those inquired about in cross-int. 5, except that perhaps the teeth in this cutter are shorter than those in the cutters inquired about in the former interrogatory?

Ans. It does appear to have been made for trimming shoe-sole edges, and it has a slot apparently adapted to receive a bar, and I discover no material differences in the proportions of the cutter.

Cross-int. 10. When cutters were produced by the method shown in Exhibit Orcutt Patent of 1879, No. 212,971, was there not, in your opinion, a decided advantage in undercutting the lower portion of the front face of the teeth, whereby the thickness of the base of the teeth is diminished, and the bending process to produce clearance described in that patent is proportionately facilitated? How is this?

Ans. There was a decided advantage in undercutting to facilitate bending, and the further advantage of producing less surface to be ground after the teeth were bent.

Cross-int. 11. Please state whether in your opinion there is any material difference in the form and proportion of the teeth shown in the Orcutt patent of 1879 and in the teeth shown in the cutters marked Compl'nts' Exhibit Busell Cutter (Orcutt patent of 1881) and the cutter shown in Compl'nts' Exhibit Cutter 12, S 56, F. M. S. & Co.; and if you think there is, please state in what it consists.

Ans. I observe no material difference between the form and proportions of the teeth of the exhibits and the teeth shown in the Orcutt patent of 1879. The only difference observable is that of dimensions.

Cross-int. 12. Please examine the cutter now shown you, marked Complain'ts' Exhibit Cutter 12, S 56, Brown & Sharpe, and state whether in your opinion, with the exception of an increased thickness of the rand lip, it does or not embody the essential features of complainants' patent.

Ans. It does not in several particulars. It has not a practical rand-cutter, and the rake of the flat front face of the teeth is wanting, which is shown in complainants' patent, and the general shape of the tooth varies in other particulars, such as lacking clear-
354 ance on the top of the tooth. There is a difference in the length of tooth and in the form of the flat front face of the tooth.

It presents a strong metal milling tool, while the complainants' patent shows a tool incapable of performing a milling tool's work in any practical sense.

(All the foregoing answer objected to except the first three words, and for the reasons already stated.)

Cross-int. 13. In view of the invention shown and described and claimed in complainants' patent, do you think there is or not a substantial difference between the cutters marked Compl'nts' Exhibit Busell Cutter (Orcutt pat. of '81) and the cutter marked Def'ts' Exhibit Eppler Cutter?

Ans. The difference that exists between the cutters is only sub-

stantial in respect to practicability, in that one is more practical as a shoe-trimmer for commercial purposes than the other.

Cross-int. 14. The question is repeated with the request that the witness will give a direct answer either one way or the other.

Ans. The cutters are substantially alike in principle and are different only as I have already stated.

Cross-int. 15. Then if a cutter like the Exhibit Eppler Cutter will mill metal with an ordinary speed of rotation and an ordinary feed of the bed, and will also trim shoe-sole edges in good shape and facility, would or not the distinction that is sought to be drawn between milling-cutters and sole-edge trimming-cutters seem to be imaginary rather than real?

Ans. It might if it would do it.

Cross-int. 16. Which do you think it will not do?

Ans. I think the Eppler cutter will not mill metal in what I understand to be any practical or commercial sense.

Cross int. 17. Do you think it is, in a strict and proper sense, in view of complainants' patent, a sole-edge trimming-cutter?

Ans. I think that it will trim soles very well, but it will not be as practical a cutter for shoe manufacturers as complainants' cutter, in so far as it lacks the advantages indicated in complainants' patent. It is a practical shoe-trimmer undoubtedly, but not so practical as the other.

Cross-int. 18. Please answer the same question with reference to Def'ts' Exhibits Howell Cutter, C. H. Brown's Milling Cutter,
355 C. H. Brown's Milling Cutter No. 2, Stephenson's Cutters No. 2 and No. 3.

Ans. I should say they were all fair shoe-trimming tools, as far as their appearance goes, but lacking the advantages already stated of the complainants' cutter.

Cross-int. 19. In the two last answers you have spoken of the advantages indicated in complainants' patent as not being found in the Defendants' Exhibit Cutters referred to in the two last questions. Please indicate briefly and concisely what the advantages are that you refer to.

Ans. Principally the advantages of sharpening, because the complainants' cutter presents less surface to be sharpened, and consequent economy in the use of the delicate emery wheels necessary to sharpen it.

Cross-int. 20. Please examine price-list of the Busell Trimmer Co., marked Compl'nts' Exhibit Price List, and more particularly the last seven lines on the first printed page and the cuts there referred to shown on pages 17 and 18, and state whether you find in the illustrations there shown anything materially different from what is shown in Def'ts' Exhibits Stephenson's Cutters No. 2 and 3, Howell's Cutter, C. H. Brown's Milling Cutter, C. H. Brown's Milling Cutter No. 2, and Eppler Cutter.

Ans. The advantages of sharpening, hitherto mentioned, which are shown in Compl'nts' Exhibit Orcutt Cutter and in complainants' patent appear to be equally wanting in these cuts as in the shoe-trimming tools referred to in the question, and, so far as can be

determined from the cuts in the price-list, I can see little difference between them and the exhibits referred to.

Cross-int. 21. Please examine Compl'nts' Exhibit Orcutt Cutter, 1st style, in connection with complainants' patent, and state whether you discover any material differences between the two; and, if so, state what they are.

Ans. I discover no material difference between those two things, except that the Compl'nts' Exhibit Orcutt Cutter, 1st style, shows one of its sides partly cut away, while the drawing does not.

(Noon recess.)

Cross-int. 22. Please compare Compl'nts' Exhibit Orcutt Cutter, 1st style, with Compl'nts' Exhibit Busell Cutter (Orcutt
356 patent of '81) and with Def'ts' Exhibits Eppler Cutter, Howell Cutter, C. H. Brown's Milling Cutter, and C. H. Brown's Milling Cutter No. 2, and Stephenson's Cutters Nos. 2 and 3, and state whether, in your opinion, said Exhibit Orcutt Cutter, 1st style, in the matter of the form of the front of the teeth and the facility for grinding the same more nearly corresponds with said Busell Cutter (Orcutt pat. of '81) or with Def'ts' Exhibits above named in this question.

Ans. I have examined the cutters. The Compl'nts' Exhibit Orcutt Cutter, 1st style, is more nearly like the Compl'nts' Exhibit Busell Cutter than the other exhibits referred to [in respect to grinding, because it is not necessary for an emery wheel to touch the bottom of the space between two teeth, and consequently the wheel is saved to an important extent. The wheel grinds simply upon one of its sides. In case of the other exhibits the root of the tooth extends to the bottom of the space between it and the succeeding tooth, and the emery wheel must grind not only the entire front flat face of the tooth, but a portion of the additional surface at the bottom of the teeth between them. Consequently the emery wheel wears out faster than it would in the other case].

(All the foregoing answer included in brackets objected to as not being called for by the question, as being argumentative and in violation of the request made to this witness not to extend his views upon the record in matters not inquired about; and, besides, the subject-matter of the question is one which will be perfectly obvious to the court upon inspection of the several exhibits.

Cross-int. 23. Please state, if you know, why, in the several tests made in milling metal at Brown & Sharpe's of which you testified, that only cutters of defendants' make were used which were undercut at the base of the teeth like Compl'nts' Exhibit Busell Cutter (Orcutt pat. of '81), instead of testing cutters like Howell's, Brown's, Stephenson's, and Eppler's.

Ans. All that I know about the matter is that a series of shoe-trimming tools, with a series of Brown & Sharpe milling-cutters having the same peripheral configuration upon them as the trimming tools, were presented to be tried, and I am not aware that any particular selection was made. [The trials were conducted by the ex-

perts and with the results narrated by the witnesses until
357 near the close of the day and until the experts were tired of proceeding any further.]

(So much of the answer objected as is included in brackets as in no respect called for.)

Cross-int. 24. If trimming-cutters like Compl'nts' Exhibits Busell Cutter (Orcutt pat. of '81) and Def'ts' Exhibits Howell Cutter, Eppler Cutter, Stephenson Cutters, and C. H. Brown's Cutters were both well known in the art of trimming shoe soles, and it was desired to determine the question whether similar cutters would be practical for trimming leather and milling metal, which do you think would be a fairer test, to select a portion of each kind or to select only the weaker kind? In answering this question please refer to pages 289 and 290 of the printed record, cross-int. 57, where one of the defendants' witnesses informed the complainants that the undercut teeth like Compl'nts' Exhibit Busell Cutter (Orcutt pat. of '81) are liable to be broken in trimming leather.

Ans. It would be a fairer test to use a portion of each kind of cutters, and, as I understood the case, cutters were selected indiscriminately in open market and presented for these trials. So far as the committee expressed themselves, they were satisfied that the cutters were tried without selection, and they emphatically expressed themselves to me that none of the cutters presented would perform the proper functions of milling tools in any sense that is practical in a machine shop, and this opinion they based upon experiments they made, and they considered it useless to continue the experiments any further. In my presence they were asked to select any cutters they chose, and they declined to do it, stating in terms that all these cutters were useless as practical milling tools, in their judgment.

Cross-int. 25. In your last answer, in stating that in your presence the committee were asked to select any cutters that they chose, do you wish to be understood that you had before you, for testing, cutters like Exhibit Busell Cutter (Orcutt pat. of '81), with undercut teeth, and also cutters like Def'ts' Exhibit Eppler Cutter, Howell Cutter, Stephenson Cutters, and C. H. Brown's Cutters, and that you invariably selected the weaker or undercut kind, or do you mean that you selected from the cutters furnished, and that they were all undercut?

Ans. The cutters that were presented to the committee had various lengths and strength of teeth. I cannot say whether
358 any of them were exactly like the exhibits mentioned or not at this length of time since the experiments, but my impression is that some of them were substantially like the defendants' exhibits referred to in the question, and I do not mean to be understood that only the weakest specimens presented were tested, but that the cutters were taken indiscriminately from the collection. The committee themselves made their own selection from all that

were presented and conducted the experiments independently of the complainants or their expert.

JOHN A. COLEMAN.

Attest: WM. A. COPELAND,
Special Examiner.

Second Deposition of O. L. Noble.

BOSTON, *Sept.* 17, 1885.

Present: Counsel as before.

(It is agreed by counsel that the following statement of Mr. Noble in narrative form be taken as his testimony on direct examination, it being a part of the affidavit given by Mr. Noble for use at the hearing on question of preliminary injunction.)

My name is Oscar L. Noble, and I have before testified in this case.

As to the affidavit of Frank M. Stevens, the suit at law returnable at the May term, 1882, against Stevens and Cunningham was included in the settlement with the Corthell Manufacturing Company, as well as all suits pending at the time of that settlement, viz., No. 1487, *vs.* Keith; No. 1496, *vs.* White, and No. 1673, against the Corthell Manufacturing Co. *et al.*, all in equity; final decree for complainant July 6th, 1883; No. 1798, at law, *vs.* Frank M. Stevens *et al.*, July 6th, 1883; judgment for plaintiff.

When I employed Stevens to work for the Busell Trimmer Company one of the grounds urged by me was that it was certain that one of the parties to the suit against the Corthell Company must succeed, and that if we succeeded Stevens & Co. would, of course, lose their business, while if the Corthell Company succeeded
359 any one had the legal right to make cutters. That part of Stevens' affidavit which relates to my talk with him when I employed his firm to work for the Busell Company is wholly false in substance, although it sets forth my exact language, as near as I can recollect it; but it is false, nevertheless, for the reason that it omits all reference to the other alternative which I stated. It is, therefore, wholly unfair. I made it perfectly clear that the Busell Company would push the suit to final hearing, and also made it clear that in any event the position of Stevens and his firm would not be enviable, for if we won they could not make, because we would stop them, and if the Corthell Company won any one could make.

Stevens' statement as to my having said that it was a great mistake that the Orcutt patent had not been taken out in his name instead of Orcutt's, as he, Stevens, was the one to get up the cutter, is a falsehood without the shadow of a foundation. I knew Stevens when he was at work for David Whittemore in 1878, and he was detailed to do work that I took into Mr. Whittemore's shop. Until Stevens testified in the suit *vs.* Corthell (on pages 70 and 71 of the printed record) I never had any reason to believe that he had ever made a cutter in 1878 except those made for me and Whittemore.

In the spring or early summer of 1878 Stevens made two or three cutters like these described in Corthell's patent No. 207,395. He made all the cutters of that kind I ever had.

Late in the fall of 1878 he made for me one or two cutters precisely like these shown in Orcutt's patent, but this was two or three months after Orcutt had produced his first cutter and after I had made up my mind that the Orcutt cutter would be our standard cutter.

It was not until after I had become satisfied that Orcutt's invention was the best cutter then known that I employed David Whittemore to make it and had Stevens detailed to that work, my object being to ascertain just how cheaply the cutters could be made with inserted blades. The result of the work of Stevens satisfied me that I would do better to go direct to Brown and Sharp to get the cutters made, because the cutters with inserted blades, although as good as any I have ever had made, were too expensive.

I went to Brown & Sharp's first in January, 1879, and at that time I had prepared to put these Orcutt cutters upon the market,
360 and had also concluded to have them made in one piece of metal instead of with inserted blades; and, as I recollect it, it was only a short time before that that Stevens made these Orcutt cutters for me.

My attention is called to Stevens' statement in his 5th, 7th, 9th, and 12th answers (pp. 71 and 72), and, as I understood that statement, it amounts in substance to a statement that Stevens made the first Orcutt cutter he ever made for me in the fall or winter of 1878; that he made a second Orcutt cutter for me shortly after the first (and all this is true), and that he had a conversation with me about the Corthell cutter, either at the time he made the first Orcutt cutter for me or at some other time, in which he suggested turning the moulded surface up—that is to say, the moulded surface of the Corthell blade being the front of the tooth. I understand Stevens to swear that he, Stevens, suggested making that moulded surface the top of the tooth, and that the result was that he, Stevens, made the cutter in that way.

This is false except to this extent, that it was general talk that the Orcutt cutter was the Corthell cutter with the blade turned to bring the moulded surface up.

But Stevens, in fact, made several Corthell cutters with the moulded surface forming the front face of the blade about six months before he made the first Orcutt cutter for me, and never suggested any change whatever in the Corthell cutter, and I never spoke to Stevens nor he to me about the Orcutt cutter until after I had made up my mind that it would be our standard cutter, and my sole reason for going to David Whittemore's to get the Orcutt cutter made was because I thought I could get it cheaper than elsewhere, Whittemore having been employed by the Busell Company in January, 1878.

Judging from Stevens' second answer, p. 70, he has forgotten about making cutters for me like those of the Corthell patent, No. 207,395. The truth is that he made two or three Corthell cutters for me be-

fore August, 1878, and made two or three of the Orcutt cutters for me several months after August, 1878, but that he never, directly or indirectly, intimated to me that he had any knowledge of the Orcutt cutter except what I gave him, and his so-called suggestion was a statement of fact—that is, that the Orcutt cutter was the Corthell cutter with the blade turned to bring the moulded surface
361 up, and not a suggestion that the blade of the Corthell cutter should be turned to bring the moulded surface on top.

The intimations contained in Stevens' 12th, 13th, and 14th answers, p. 72—first, that he suggested to me turning the blades of the Corthell cutter to bring the moulded surface up; secondly, that he made an Orcutt cutter in accordance with that suggestion, and, thirdly, that the cutter so made by him was the first of the kind that I had seen—are wholly false.

The settlement with the Corthell Company was no doubt brought about partly by my statement that if they won their suit the cutter business would become public property, but in view of the terms of the settlement I have no doubt that they were also influenced very largely by fear of losing the suit.

As soon as I ascertained that F. M. Stevens & Co. were infringing the Orcutt patent I gave instructions that a suit be brought and their property attached; this was done and the bond was given. This suit was brought because I believed that Stevens & Co. would see that they had made a blunder and would desist from their infringements, but on finding that they would not I was advised that the only course open to us was to abandon the suit at law and file a bill of complaint for an injunction.

In view of Stevens' statement as to the employment of his firm by the Busell Company, I repeat the statement contained in the second paragraph, p. 16 of the printed copy of my affidavit, and also say positively that the firm of F. M. Stevens & Co. were treated by the Busell Company not only with the utmost fairness, but with very unusual liberality.

I expressed fully to both Stevens & Cunningham my opinion when I found that while in our employ they were selling goods made for us and with our special tools in infringement of our patent, and possibly used the words "mean dirty trick" or equivalent words, and also no doubt told them that I would spare no pains or expense to break up their business; but I certainly did not say that I would resort to any mean dirty trick, although I did say that I would use all legal means to stop them.

There was some talk as to competing with them in the manufacture of seam-finishers—not rotary, as Stevens says, but re-
362 ciprocating as distinguished from rotary—but on investigating the matter another patent was found which I was advised stood in the way.

What I have said as to Stevens' affidavit also replies to the affidavit of Cunningham; but as a further reply I state that while it is true that we fell short nearly $5,000 in the total amount of orders, yet the reason was perfectly well known to all the parties, and that reason was that we refused to give any orders until such as we had

given were filled—that is to say, we gave the firm of Stevens & Co. all the work they could do, and, in addition and as an inducement to make them fill our orders more promptly, paid them frequently more than was due; but we did positively refuse to give them orders on several occasions on the ground that they were in arrears to us and indebted to us for money advanced to enable them to fill orders then unfilled.

Cunningham's statement that the Corthell stockholders regarded the terms we offered them as "unequal, oppressive, and unjust" I believe to be true, yet they were the best terms the Busell Company felt justified in offering in view of what we believed to be the weakness of the defence made by them to our suit against them.

As to the affidavit of Milton L. Eddy, it is true that when Eddy, Sherman & Company first commenced to compete with us they made a few cutters without the rand lip or rotary welt knife, but they very soon commenced to imitate our cutters—the Orcutt cutter—exactly. The suit at law that we brought against Eddy, Sherman & Co. was settled with the other suits.

Mr. Eddy is also correct *that* in saying we spared no pains or expense to impress upon the trade our theory and belief that the Tayman reissue controlled all cutters with a rotary rand lip or welt knife. That was then our theory and belief, for, as I have before stated, I have no doubt that Tayman was the first to produce a rotary rand lip or welt knife, but I am advised that in view of certain decisions of the Supreme Court of the United States relating to reissues it is questionable whether the Tayman reissue will be sustained by the courts.

Mr. Eddy is mistaken in supposing that the negotiations for a compromise were not commenced until after the testimony on behalf of the Corthell Company was completed. They were
363 commenced long before that, but it was not until after that that the Corthell Company showed a willingness to accept any terms which the Busell Company deemed reasonable.

After that testimony was taken the Busell Company felt themselves strong enough to dictate the terms of settlement, especially after Stevens & Co. deserted the Corthell Company and became employés of the Busell Company, which is what I understand Mr. Eddy to say in substance, although he speaks with much bitterness against the Busell Company.

Mr. Eddy and his partner, Mr. Walker, did strongly oppose the settlement, and their opposition was the main reason for the delay from October, 1882, till February, 1883, when the settlement was finally agreed upon, although not consummated until later.

Mr. Eddy gives an unfair report of the reasons urged by the Busell Company's manager—meaning me, I suppose—for the compromise. I did, as I have before said, urge that, in view of the Tayman patent being a reissue taken more than two years after the original, its validity was doubtful, and consequently that if the Corthell Company should succeed in defeating the Orcutt patent it would make the cutter public property, but I also urged, as I then believed and now believe, with much force that Mr. Eddy's opinion

as to lack of patentable novelty *were* all wrong, and that the evidence taken in behalf of the Corthell Company simply emphasized our position, which was that there was no doubt that Orcutt was the first to invent a practical rotary cutter with a rand lip, a bed, and a guard, and this was not only an invention, and hence a patentable novelty, but was also the greatest invention ever made in the art of sole-edge trimming.

Corthell's 13th and 14th answers, pp. 51–'2, are disingenuous. In all cases a portion of the rand is taken out by the Orcutt cutter. Full ninety per cent. (90%) of all the work done with the Orcutt cutter is on edges which are trimmed completely at one operation; less than 10 per cent. are even touched with a separate welt knife.

Corthell's 49th and 50th answers, p. 58, are grossly incorrect, for Corthell must be well aware that the Coté machine runs with the Bolling cutter, and the Excelsior trimmer (which is the same thing as the Coté machine with the Bolling cutter) and the cutter
364 marked Defendants' Exhibit Rounds' Rand and Edge Cutter were not adapted to anything but plain edges, and that that was the sole reason why these machines were so little used.

As to the date of Orcutt's invention, the first I clearly recollect of it was when he described it to me in the house I then occupied on Quincy street, Boston Highlands. I know I left that house in May, 1878, and I also know that it was in that house that Orcutt first described his invention to me, and we discussed it fully, both of us feeling afraid that it would infringe the patent under which the Brown & Sharp milling-cutters were made, which we then thought covered sharpening by grinding on the flat front face of the tooth. I also know that I saw one of Orcutt's cutters as early as August, 1878, and that I took one of them to David Whittemore's and showed it to his foreman, Albert Leavitt, as he has testified in his affidavit.

I cannot definitely fix the date when I showed this Orcutt cutter to Leavitt, and it may be that it was before August or it may have been during that month. My impression is that it was before August; it was certainly a month or two before I had Stevens make the Orcutt cutter.

In my answer to question 13, p. 23 of the record in the Corthell suit, I had in mind an Orcutt cutter made of one piece of metal, as distinguished from an Orcutt cutter made of a hub with inserted blades.

I should add that I have had much difficulty in definitely settling the date when I first had knowledge of Orcutt's invention, and have not been able as yet to determine definitely just when I first saw one of the Orcutt cutters. I do know with certainty that the first one I ever saw was at Warren Haskell & Co.'s shop, on Charlestown street, Boston, and that it had inserted blades, being in all respects precisely like Fig. 1 of Orcutt's patent, No. 238,303, and I feel sure that this was before August, 1878, but just when it was I have been unable so far to ascertain with certainty.

My best recollection is that I had the talk testified to by Mr. Leavitt and Mr. Whittemore in May or June, 1878, but, as I have

been unable to recall any particular circumstance, I cannot say positively more than that it was a few days after I first saw one of Orcutt's cutters.

While I cannot with certainty give the date when I first saw one of Orcutt's cutters, I can and do state positively that the
365 order of events was that in the spring of 1878 Orcutt described his cutter fully to me at my house in Quincy street; that shortly after that—it does not seem to me over a month—I saw for the first time one of Orcutt's cutters, and that as soon as I saw Orcutt's cutter I felt sure that it was far superior to any other, and that I have no doubt that I showed the Orcutt cutter to Leavitt and Whittemore within a few days after I first saw it.

I also testify positively that I heard no talk about the Brown & Sharp patent at David Whittemore's until after I showed an Orcutt cutter to Leavitt and Whittemore, and that there was a good deal of talk about the Brown and Sharp patent after that talk between Leavitt, Whittemore, and myself.

Direct examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Int. 1. Please refer to the second paragraph, page 179, and to Int. 12, page 180, Corthell's deposition, and state what is there meant by the Brown & Sharpe cutter.

(Objected to as incompetent.)

Ans. The Orcutt cutter manufactured by Brown & Sharpe for the Busell Co. That is what I suppose it means. It can't mean anything else.

Int. 2. Please refer to interrogatories 17*a* to 19, inclusive, pages 181 and 182, and explain the purpose and effect of the groove across the Orcutt cutter with a separate rand knife, and also state whether you make them that way now or not.

Ans. When we first made the Orcutt cutter like Def'ts' Exhibit Brown & Sharpe Slotted Cutter it was to enable the operator to introduce a straighter and longer lip into the same cutter to obviate the necessity of changing the entire cutter when such change in the lip only was wanting.

I can't say how long we continued to make them, but we soon found it was convenient and produced better results by changing the entire cutter than by getting the change by changing the welt knives only. A very few users of the cutter desired to con-
366 tinue the use with separate welt knife, and we continued to make them in very limited quantities on special orders for a long time.

Cross-examination waived by T. W. Porter, Esq., of counsel for defendants.

O. L. NOBLE.

Attest: W. A. COPELAND,
Special Examiner.

Deposition of Albert Leavitt.

BOSTON, *Sept.* 18, 1885.

Present: Counsel as before.

It is agreed by counsel that the following statement of Mr. Leavitt in narrative form be taken as his testimony on direct examination, it being the same as given by him in affidavitt at the hearing on question of preliminary injunction:

My name is Albert Leavitt:

I am a machinist, and have been for over 30 years.

My first experience with machinery for trimming sole edges was in 1873, on the Coté machine. At that time the old burr-cutters (like Exhibit Burr Cutter) were used upon that machine, but shortly after the cutters used were like the longer one of the two marked Exhibit Coté Cutter (Knights' patent). I had nothing to do with making the cutters until late in 1876, and at that time all the cutters made for sole edges were like the smaller one of the two marked Exhibit Coté Cutter (Knights' patent)—that is, with a groove for the rand knife. About a year after that, late in 1877 or early in 1878, some arrangement was made between David Whittemore, my employer, and the Busell Company, and we began to make the blades for cutting like the one marked old Busell cutter for the Busell Company.

These were the only rotary cutters I knew of for trimming sole edges until I saw a cutter like the one marked Exhibit Cutter, Corthell patent, No. 207,395, Aug. 27th, 1878.

367 Shortly after I first saw this Corthell cutter with teeth with a flat top and molded front face O. L. Noble showed me a cutter just like the one shown in Fig. 1 of the Orcutt patent, No. 238,303, dated March 1st, 1881, a copy of which is now before me. I cannot fix the date with certainty, but I know it was in 1878 and on a hot day, for I recollect that I was eating my lunch at the time.

I saw at once that the cutter then shown me by Noble was altogether better than the Corthell cutter with flat-topped teeth. After examining this Orcutt cutter shown me by Noble it occurred to me that it could be made as Brown & Sharp made their milling-cutters, and that that way of making it would be cheaper than inserting the blades in the hub. I went into the tool-room and got a Brown & Sharp milling-cutter and talked it over with Noble.

This is the talk referred to in my deposition, on page 96 of the printed testimony, in the suit against the Corthell Company, but I now think I was mistaken as to the date, for it must have been as late as the summer or fall of 1878, although I have no very satisfactory means of fixing the date.

I do know that I never thought of the Brown & Sharp milling-cutter in connection with sole-edge trimming until Noble showed me the cutter just like figure 1 of Orcutt's patent, No. 238,303, nor ever heard of any suggestion of this kind until after Noble showed me the Orcutt cutter. After that time there was a good deal

of talk about the Orcutt cutter and how the Brown & Sharp cutters affected it.

I now recollect another circumstance relating to this matter. When Noble and I first talked about the Corthell cutter with flat-topped teeth Noble told me that he would show me a cutter in a few days which would beat that all hollow, and the cutter he showed me was the Orcutt cutter above referred to.

I know that F. M. Stevens was employed to make the first Corthell cutters with flat-topped teeth, and I also know that he afterwards was experimenting on cutters under Noble's direction; but if he ever made an Orcutt cutter (as I am told he swears he did) except under Noble's direction I never knew of it or heard of it until to-day, although I was superintendent of Whittemore's factory and it was my business to know what all the men were doing. What
368 Stevens was directed to make when he was experimenting under Noble's instructions I should not be likely to know, but I feel sure that I do know all the work he did, including what he did when he was working under Noble's instructions.

I have been familiar with the Brown & Sharp milling-cutters for upwards of ten years, and while I see that the Orcutt cutter is made on the same principle, yet I have no doubt that the Orcutt cutter is an invention, for the reason that it is the only practical rotary cutter ever made, so far as I know, with a bed, a rand lip, and a guard, and it seems to me plain that this is a novel and valuable idea. I mean the idea of adapting the hand plane for use in a machine. Of course, after this idea has once got into a man's mind he will have no trouble, if he is a skilled workman, in making the cutter, but that is true of a great many inventions.

I say the Orcutt cutter is the only practical rotary cutter ever made with a rand lip, a bed, and a guard, because, in my opinion, the Corthell cutter with flat-topped teeth is not practical, for it would take an expert to sharpen it without getting it out of true—that is, it is impossible, without extraordinary care, to sharpen it and keep the cutting edges of the teeth at the same distance from the center. Nobody but an expert could do it, and it would be a very difficult job, indeed, for the best expert.

This Corthell cutter with the flat-topped teeth is the first rotary cutter I ever saw or heard of with a rand lip and a bed in one piece, and the Orcutt cutter is the only one I ever saw or heard of which was adapted for practical use on all classes of edges.

My attention is called to the 54th question and answer of Samuel N. Corthell, page 59. What he says is true, all but the date. I feel sure he is mistaken in the date, for it was certainly after Noble had shown me the Orcutt cutter. There was no talk about the Brown & Sharp milling tool as a rotary trimmer until after Noble brought in the Orcutt cutter. When this was I have no means of determining any closer than that it was in 1878, on a hot day.

I am told that Corthell swears, in his 52d and 53d answers, pp. 58 and 59, that F. M. Stevens made a cutter solid and freed back, like Exhibit Defendants' Cutter, in the summer of 1878, and that Stevens

swears to the same thing in his fourth answer, pp. 70 and 71.

369 It is certain that I never saw this cutter and never knew of it until now, and I am sure that such a cutter could not have been made at David Whittemore's shop without my knowledge. To make a cutter of that kind it would be a very difficult and laborious job with the machinery in Whittemore's shop, and I am positive that I should have known it had any such cutter been made there in 1878.

Cross-examination by T. W. PORTER, Esq., of counsel for defendants:

Cross-int. 1. Have you heretofore given a deposition in the suit brought by the complainant company against the Corthell Manufacturing Company, then pending in the United States circuit court?

Ans. Yes.

Cross-int. 2. When was that deposition given?

(Objected to, as it is a matter of record in the case.)

(Counsel for defendant states that he puts the question to test the memory of the witness as to dates.)

Ans. Well, as I remember, I should say four years ago.

Cross-int. 3. Where were you working at that time?

Ans. 271 Franklin St., Boston.

Cross-int. 4. Were you in business there for yourself then?

Ans. I was.

Cross-int. 5. Where is your place of business now?

Ans. 271 Franklin St., Boston.

Cross-int. 6. Since giving the deposition in the Corthell suit have you had contracts with or been doing work for the complainant company?

Ans. I have.

Cross-int. 7. Had you had contracts with or done work for the Busell Company before giving that deposition?

Ans. I had not.

Cross-int. 8. How long after giving that deposition before you had contracts with or did work for that company?

Ans. As near as I could remember, two years.

Cross-int. 9. About how long ago should you think it was since you had such business arrangements with the Busell Company?

Ans. I think it is about a year and a half ago.

370 Cross-int. 10. Who first saw you or how was the arrangement brought about between yourself and the Busell Company?

Ans. It was made with James H. Busell.

Cross-int. 11. How long after making the arrangement with James H. Busell, as stated, did you continue to perform work for the Busell Trimmer Co.?

Ans. Why, directly after they bought him out.

Cross-int. 12. It would seem that the last question was not clearly understood by you. What is desired to know is this: Have you con-

tinued to the present time to do work for the Busell Trimmer Co., or when did you quit doing work for that company?

Ans. I have continued to work for them all the time.

Cross-int. 13. Please examine the four cutters now shown you—Complainant's Exhibits Cutter 2 S 90, Brown & Sharpe; Cutter 9 S 62, Brown and Sharpe; Cutter 12 S 56, Brown & Sharpe; Cutter 4 S 80, Brown & Sharpe—and state whether, in your opinion, the teeth are of the usual and average proportion, considering their length and thickness of base, and in considering this question please refer to the catalogue of the Brown & Sharpe Manufacturing Co. now shown you and to the cuts of their milling-cutters shown on pages 38, 39, 41, 51, 55, 56, and 57.

(Objected to as not opened on the direct.)

Ans. I should say the proportions are about equal.

Cross-int. 14. Will you please measure and give the thickness of base of teeth and length of tooth shown in some of those drawings and some of the cutters referred to?

(Same objection.)

Ans. I have nothing to measure them with here.

Cross-int. 15. Please compare the teeth in those four cutters in the same respects with the cutter now shown you, marked Exhibit Brown & Sharpe Milling Cutter No. 2, and state how they compare.

(Same objection.)

Ans. I should say the base of the tooth was identically the same as the others, but I should say the tooth of the Brown & Sharpe Milling Cutter No. 2 was the longer.

Cross-int. 16. Please make the same comparison with reference to the cutter now shown you, marked Complainants' Exhibit Brown & Sharpe Milling Cutter No. 1.

371 (Same objection.)

Ans. I should say the proportions were carried out the same as with the Brown & Sharpe milling cutter No. 2.

Cross-int. 17. Please answer the same question with reference to Exhibit Brown & Sharpe Milling Cutter.

(Same objection.)

Ans. I should say the proportions were the same right through. The diameter is less and there are less teeth than in Brown & Sharpe milling-cutter No. 2, but the proportions are the same.

Cross-int. 18. The question does not refer, as you will observe upon looking at the previous questions, to the diameter of the cutters or the number of teeth, but to the relative strength of the teeth—that is, the relations of their height or length, which is the same to their thickness at the base. Now, please compare the Exhibit Milling Cutter with the four cutters marked Complainants' Exhibits Cutter 2 S 90, Brown & Sharp; Cutter 12 S 56, Brown & Sharpe; Cutter 9 S 62, Brown & Sharpe, and Cutter 4 S 80, Brown & Sharpe, and state

whether or not the teeth in Complainants' Exhibit Milling Cutter are not much longer in proportion to their thickness than in either of the other four exhibits referred to.

(Same objection.)

Ans. The teeth in the milling-cutter are longer and weaker than in either of the other four.

(The Brown & Sharpe catalogue referred to in the 13th cross-int. is now put in evidence and marked. Defendants' Exhibit Brown & Sharpe Catalogue, W. A. C., sp'l ex'r.)

Cross-int. 19. Where did you first see a cutter made like those now shown you, marked Compl'nts' Exhibit Busell Cutter (Orcutt pat. of '81) or like that marked Def'ts' Exhibit Howell Cutter?

Ans. I can't give the exact date to a month, but it was while I was at work at Whittemore's. I think it was in 1878.

Cross-int. 20. Who first showed you one of the so-called Orcutt cutters?

Ans. Mr. Noble.

Cross-int. 21. Please describe it—how it was made, and so forth.

Ans. I can't describe it, except that it was made similar to this cutter, Compl'nts' Exhibit Busell Cutter (Orcutt pat. of '81), molded—
backed off similar to the Brown & Sharpe milling-cutter.
372–374 I can't describe how it was made, for I know nothing about it. It wasn't made in the shop. I supposed it was backed off like the Brown & Sharp cutter, which I afterwards learned wasn't so. Instead of being cleared back the tooth was tipped back—bent back.

Cross-int. 22. Have you described all the differences that you know of between that first cutter and these before you, marked Compl'nts' Exhibit (Orcutt pat. of '81)?

Ans. As I remember, I have.

Cross-int. 23. Do you remember when you first saw a cutter like Compl'nts' Exhibit Corthell Patent Cutter (pat. No. 207,395)? And, if so, please state when and where it was, what was being done with it, and who was present.

Ans. We made similar cutters to this in Whittemore's factory in the year 1878. I don't know what was done with it except experiment. It wasn't thought to be a success, and we never made but a few. Mr. Corthell was present and Mr. Stevens. There were other men in the shop. I don't know any other men in particular who had anything to do with the cutters. Oh! Mr. Rollins, I guess. Yes; Mr. Rollins worked on the cutters.

Cross-int. 24. Do you remember of your remarking at that time that you had an idea of a trimming-cutter that was better than the Corthell cutter and would do better work?

Ans. I remember of having a conversation with Mr. Corthell with regard to making a cutter on the Brown & Sharpe principle, and that Mr. Noble had talked with me on the same thing, and he also made the remark that he should show me a cutter in a few days that would beat them all. We never had done anything about a

cutter made in that way, for the reason that we should interfere with Brown & Sharpe patent. That was the conversation between us at the time.

Cross-int. 25. Please state whether or not this conversation was when you first saw one of the Corthell cutters like Exhibit Corthell Patent Cutter (patent No. 207,395).

Ans. That conversation was after this cutter had been made (referring to the Exhibit Corthell Cutter, pat. No. 207,395).

ALBERT LEAVITT.

Attest: WM. A. COPELAND,
Special Examiner.

375 & 376 Circuit Court of the United States, District of Massachusetts. In Equity.

BUSELL TRIMMER CO. *et al.*
v.
CORTHELL MANUF'G CO. *et al.* } No. 1673.

Pleadings and Evidence.

James E. Maynadier, for complainants; Porter & Hutchinson, for defendants.

377 District of Massachusetts. In Equity.

BUSELL TRIMMER CO. *et al.*
v.
CORTHELL MANUFACTURING CO. *et al.* } No. 1673.

Bill of Complaint.

To the judges of the circuit court of the United States for the district of Massachusetts:

The Busell Trimmer Company, a body corporate under the laws of the State of New Hampshire, having its principal place of business in Nashua, in said State, and a citizen of said State, and William D. Orcutt, of Boston, in the State of Massachusetts, and a citizen of said State, bring this their bill of complaint against the Corthell Manufacturing Company, a body corporate under the laws of the State of New Hampshire, but having its principal place of business in Boston, in the State of Massachusetts, and Alfred A. Mower, of Lynn; Edward M. Farnsworth, of Revere; Edward Maynz and Melton L. Eddy and John Q. Adams, all of said Boston and all citizens of the State of Massachusetts.

And thereupon your orators complain and say that heretofore and before the sixth day of January, 1879, William D. Orcutt was the original and first inventor of a certain new and useful rotary cutter for trimming the edges of boot and shoe soles not known or
378 used before and not in public use or on sale for more than two years prior to his application for a patent therefor.

And your orators further show unto your honors that said Wil-

liam D. Orcutt, so being the inventor of said improvement in rotary cutters for trimming the edges of boot and shoe soles, made application to the proper department of the Government of the United States for letters patent in accordance with the then existing acts of Congress and duly complied in all respects with the conditions and requirements of said acts, and that on the first day of March, 1881, letters patent of the United States numbered 238,303, signed, sealed, and executed in due form of law, for the said invention or discovery were issued to said William D. Orcutt, whereby there were secured to him, his heirs, executors, administrators, or assigns, for the term of seventeen years from the first day of March, 1881, the full and exclusive right of making, using, and vending the said invention or discovery throughout the United States and the territories thereof; all which by said letters patent or by a duly certified copy thereof, now in court produced and shown to your honors, will more fully appear.

And your orators further show unto your honors that on or about the twentieth day of December, A. D. 1880, by certain licenses in writing duly recorded in the United States Patent Office, your orator, The Busell Trimmer Company, became the owner of an exclusive license to manufacture and sell rotary cutters under said letters patent No. 238,303, to be used for trimming the edges of boot and shoe soles and heels; all which by said instruments in writing, with the certificates of the recording thereof thereto annexed, or by duly certified copies thereof, now in court produced and shown to your honors, will more fully appear.

And your orators further show unto your honors that the exclusive rights so vested in your orators are of very great value and importance, and that the said patented invention has been extensively used, and that the demand therefor is very large; that your orator, The Busell Trimmer Company, is fully able to supply the said demand.

Yet the defendants, well knowing the premises and the rights secured to your orators as aforesaid by the letters patent No. 238,303, and utterly disregarding the same, have at Boston, in said district,
and at divers other places in the United States, in violation
379 of the rights secured by said letters patent, and ever since the
first day of March, 1881, unlawfully used the said patented invention, and manufactured, used, and sold large numbers of cutters, each embracing and embodying in its construction and mode of operation substantial and material parts of the invention described and claimed therein as new, and still continue so to do; and the defendants have derived and are still deriving from such use of said invention large gains and profits, but to what amount your orators are ignorant and cannot set forth; and your orators are greatly damaged by such wrongful acts and doings of the defendant, to wit, in the sum of ten thousand dollars.

And your orators further show unto your honors that they will be subject to great and irreparable damages unless your honors will grant the relief hereby sought.

To the end, therefore, that the defendants may, upon oath, full,

true, direct, and perfect answer make to all and singular the matters hereinbefore stated and charged as fully and particularly as if the same were hereinafter repeated and they thereunto distinctly interrogated, according to the best of their knowledge, information, and belief;

And that the defendants and the attorneys, agents, servants, and workmen of the defendants may be enjoined perpetually and also during the pending of this suit, by writs of injunction to be issued by this honorable court, from making, using, or selling the invention patented in said letters patent No. 238,303 or any material and substantial part thereof claimed therein as new;

And that the defendants may be decreed to account for and pay over to your orators all the gains and profits that have accrued to them from using said invention or any material and substantial part thereof claimed in the said letters patent No. 238,303 as new, and that the damages sustained by your orators may be assessed and the defendants be decreed to pay over to your orators, in addition to such gains and profits, the damages your orators have sustained by such unlawful acts and doings;

And for such other and further relief as to your honors may seem meet—

May it please your honors to grant unto your orators not
380 only the writs of injunction conformable to the prayer of this bill, but also the writ of subpœna, directed to said Corthell Manufacturing Company, Alfred A. Mower, Edward M. Farnsworth, Edward Maynz, Melton L. Eddy, and J. Q. Adams, commanding them to appear and answer to this bill of complaint and to do and receive what to your honors seem meet.

And your orators will ever pray.

THE BUSELL TRIMMER CO.,
By O. L. NOBLE, *Superintendent.*
WILLIAM D. ORCUTT,
By O. L. NOBLE.

J. E. MAYNADIER, *Of Counsel.*

UNITED STATES OF AMERICA,
District of Massachusetts, Suffolk, } *ss:*

BOSTON, *Jan.* 5, 1882.

Then personally appeared before me the above-named O. L. Noble and made oath that he has heard read the foregoing bill of complaint by him subscribed, and the same is true as to the statements made as of his own knowledge, and as to those stated upon information and belief he believes it to be true; and on oath the said O. L. Noble deposes that he is the duly authorized agent of said Busell Trimmer Co. to bring this bill.

WM. A. COPELAND,
Notary Public.

Defendants' Answer.

The said defendants, reserving to themselves all right of exception as to all the matters contained in said bill, for answer thereto, or to so much thereof as they are advised to be material to be answered unto, say—

They admit that letters patent of the United States, bearing date the first day of March, 1881, No. 238,303, were on that date granted and issued to William D. Orcutt, one of these complainants,
381 but whether his said co-complainants have acquired any right thereunder they are ignorant and will require complainants to prove the same; and, upon information and belief, defendants deny that the said Orcutt was the original and first inventor of the thing described and claimed in said letters patent or of any substantial or material part thereof, and deny that the same had not been known or used before the alleged invention thereof by the said Orcutt, and deny that the thing patented in said letters patent was useful, and aver that the said letters patent were and are in every respect, in part and in whole, invalid and void.

These defendants, further answering, say that they have no knowledge of any license, assignment, or grant under said letters patent to said Busell Trimmer Company by said Orcutt or by any person except such as is derived from the bill, and require the plaintiffs to prove the same if material.

These defendants, further answering, upon information and belief deny that the said alleged invention is of any value and advantage, or that the plaintiffs have expended large sums of money in introducing the same, or that they have introduced the same into general and public use, or that the plaintiffs have ever had exclusive possession and enjoyment of the same, or that the public have ever acquiesced in any claim by the plaintiffs or either of them to a right or title to such possession and enjoyment.

These defendants, further answering, upon information and belief aver that the specification and drawings of the said letters patent do not describe and do not show anything capable of being put into practical operation, and aver that the said patentee has not given in the said specification, including the drawings, nor filed in the Patent Office a written description of his alleged invention and of the manner and process of making, constructing, and using it in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains or with which it is most nearly connected to make, construct, and use the same.

These defendants, further answering, upon information and belief aver that in the state of the art as known and practiced at and prior to the date of the said alleged invention for which said letters patent were issued there was no patentable novelty in mak-
382 ing, constructing, or using the thing claimed in said letters patent; and these defendants give notice that they will put in evidence, as containing full descriptions of the thing patented in

said letters patent, the following-named letters patent of the United States, namely:

Letters patent No. 45294, to J. R. Brown, dated Nov. 29, 1864.
No. 157,476, to James C. Knights, dated Dec. 8, 1874.
No. 207,395, to Samuel N. Corthell, dated August 27, 1878.
No. 212,971, to William D. Orcutt, dated March 4, 1879.
No. 97758, to R. F. Burns, dated Dec. 14, 1869.
No. 136,790, to Benjamin J. Tayman, dated March 11, 1873.
Reissue No. 9073, dated February 10, 1880.
No. 167,874, to James H. Busell, dated Sept. 21, 1875.
Reissue No. 8239, dated May 21, 1878.
No. 152,728, to C. F. Davis and E. P. Howe, dated July 7, 1874.
No. 188,337, to J. H. Busell, dated March 13, 1877.
No. 198,234, to J. E. Young, dated Dec. 18, 1877.
No. 127,904, to Jas. W. Maloy, dated June 11, 1872.
No. 137,066, to B. Gallagher and J. Coyle, dated March 25, 1873.
No. 131,140, to Henry F. Wheeler, dated Sept. 3, 1872.
No. 192,616, to Augustus Balling, dated July 3, 1877.
No. 173,830, to Nathaniel S. Thompson, dated Feb. 22, 1876.
No. 44688, to H. Hodges, dated Oct. 11, 1864.
No. 135,694, to Louis Coté, dated Feb. 11, 1873.
No. 193,347, to Geo. F. Reed, dated July 24, 1877.
No. 15176, to Isaac A. Dunham, dated June 24, 1856.

Defendants will also put in evidence for the same purpose the following-described letters patent of the United Kingdom of Great Britain, Ireland, and Wales, namely:

No. 877, to Pierre François Gubault, dated March 14, 1868.
No. 746, to Charles Linford, dated March 12, 1866.
No. 2505, to James John Anderton, dated Oct. 12, 1863, and No. 220, to Benjamin Mountain, Thomas Richmond, and George Duffield, dated Jan. 23, 1869.

These defendants, further answering, upon information and belief say that the thing patented in the said letters patent No. 238,303, to Orcutt, upon which this suit is founded, or a substantial and material part thereof claimed as new, was, prior to the alleged
383 invention thereof by the said Orcutt, known and used by the following-named persons at the places respectively specified and stated, namely:

Frank Stearns, now employed at 63 Charlestown street, Boston, Mass., at Quincy, in said State; J. B. Mann, Isaac Dunham, Varanus Snell, —— Atherton (of firm of Snell & Atherton), John Kinsley, William Martin, and Melvin Snell, all of North Bridgewater, now Brockton, in said State, at said Brockton, and Charles E. Moore and M. L. Wyman (firm of Moore & Wyman, machinists), both of Boston, in said State, at said Boston, and Samuel N. Corthell, of Quincy, in said State, at Abington, in said State.

And, further answering, defendants say that at the date of said Orcutt's alleged invention and for many years previous thereto rotary cutters which in their construction and mode of operation embraced and embodied all that is shown, described, or claimed in the drawings and specification in said letters patent No. 238,303

were in common and public use in numerous shops and manufactories throughout the United States, among which were those of J. R. Brown & Sharpe, at Providence, in the State of Rhode Island, and the Providence Tool Company, at said Providence; Pratt & Whitney, at Hartford, in the State of Connecticut; Colt's armory, at said Hartford; the Ames Manufacturing Company, at Chicopee, in the State of Massachusetts; William Sellers, Thomas Word, and Bement & Dougherty, all at Philadelphia, in the State of Pennsylvania; the Singer Sewing Machine Company, at the city of New York, in the State of New York, and at Elizabeth, in the State of New Jersey; the Wheeler & Wilson Sewing Machine Company, at Bridgeport, in the State of Connecticut; the Ansonia Brass and Batting Company, at said Ansonia, Connecticut; the Bridgeport Brass Company, at Bridgeport, in said Connecticut; Holmes, Booth & Haden's and the Benedict & Burnham Manufacturing Company, at Waterbury, in said Connecticut; Mellen Bray, at Boston and Quincy, in the State of Massachusetts; the Putnam Machine Company, at Fitchburg, in said State of Massachusetts; the Fitchburg Machine Company, at said Fitchburg; A. H. Brainard, at Hyde Park, in said Massachusetts; the Lowell Machine Shop, at Lowell, in said Massachusetts; William Mason, Taunton, in said Massachusetts, and the National armory, at Springfield, in said Massachusetts.

384 And defendants give notice that they shall summon witnesses and file exhibits from each and all of the aforesaid well-known shops and manufactories in said suit as showing the state of the art at the time of Orcutt's said alleged invention.

And defendants further say that for many years prior to the date of the alleged invention for which complainants' said letters patent were obtained it was a common and well-known practice with all mechanics using rotary cutters, and especially so with those persons and at the shops and manufactories hereinbefore recited and stated, to make and use such cutters with teeth or blades provided with flat front faces, having their outer or peripheral ends moulded throughout to a uniform shape, the converse of the desired shape to be given and slightly eccentric to the axis of the cutter, and that cutters were so equally well known and in common use wherein the teeth or blades were each provided with a flat front face and a slightly eccentric outer or peripheral end, having formed thereon ridges, beads, grooves, and any and all desired configurations extending circumferentially across said outer or peripheral face, and said cutters were so formed to cut a path having a configuration of cross-section of any desired form, width, and depth.

These defendants, further answering, upon information and belief deny that they or either of them since the date of said letters patent have, at said Boston or elsewhere, made, constructed, used, or vended to be used the said patented invention, or that they are now so doing, or that they threaten so to do, and deny that they have in any manner violated any rights of the plaintiffs, or that by any unlawful or wrongful act they have in any way injured the plaintiffs or deprived them of any gains and profits.

And these defendants deny all unlawful acts wherewith they are by said bill charged, and say that the plaintiffs are not entitled to any injunction, account, damages, or other relief prayed for in said bill, without this, that there is any other matter, cause, or thing in the said plaintiffs' said bill of complaint contained material or necessary for these defendants to make answer thereto and not herein and hereby well and sufficiently answered, confessed, traversed, and avoided or denied is true to the knowledge or belief of these defendants; all which matters and things these defendants are
385 ready and willing to aver, maintain, and prove as this honorable court shall direct, and humbly pray to be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

THE CORTHELL MANUFACTURING COMPANY,
By ALFRED A MOWER, *President.*
ALFRED A. MOWER.
EDWARD M. FARNSWORTH.
EDW'D MAYNZ.
MILTON L. EDDY.
JOHN Q. ADAMS.

PORTER & HUTCHINSON,
Solicitors for Defendants.

UNITED STATES OF AMERICA,
State of Massachusetts, County of Suffolk, } ss:

Personally appeared this — day of March, 1882, the above-named Alfred A. Mower, Edward M. Farnsworth, Edward Maynz, Milton L. Eddy, and John Q. Adams, and made oath that the above answer by them subscribed is true, except as to matters stated on information and belief, and as to those matters they believe the same to be true.

Before me—

——— ———,
Notary Public, Suffolk County, Mass.

Replication.

These repliants, saving and reserving unto themselves all and all manner of advantage of exception to the manifold insufficiencies of said answer, for replication thereunto say that they will aver and prove their said bill to be true, certain, and sufficient in the law to be answered unto, and that the said answer of the defendant is uncertain, untrue, and insufficient to be replied unto by these repliants, without this, that any other matter or thing in the answer contained material or effectual in the law to be replied unto, confessed
386 and avoided, traversed or denied, is true; all which matters and things these repliants are and will be ready to aver, maintain, and prove as this honorable court shall direct, and humbly pray as in and by their bill of complaint they have already prayed.

By their solicitor, J. E. MAYNADIER.

COMPLAINANTS' EXHIBIT LICENSE 1. W. A. C., Sp'l Ex'r.

This agreement, made this first day of December, A. D. 1879, between William D. Orcutt and James H. Busell, both of Boston, county of Suffolk and State of Massachusetts, parties of the first part, and the Busell Edge Trimmer Company, a corporation organized under the laws of the State of Massachusetts and doing business in the city of Boston, party of the second part, witnesseth:

That whereas letters patent of the United States for an improvement in rotary cutters for trimming the edges of boot and shoe soles and heels were granted to the said William D. Orcutt March 4th, 1879, and numbered 212,971; and whereas one-half of said letters patent was assigned by said Orcutt to the said James H. Busell by his deed of assignment dated March 6th, A. D. 1879, which deed was recorded in the Patent Office, at Washington, D. C., on the 14th day of April, A. D. 1879; and whereas the party of the second part is desirous of manufacturing rotary cutters containing said patented improvements and using them on machines for trimming the edges of boot and shoe soles and heels: Now, therefore, the parties have agreed as follows:

1st. The parties of the first part hereby grant to the party of the second part an exclusive license to manufacture and sell rotary cutters containing said patented improvements to be used for trimming the edges of boot and shoe soles and heels and for no other purposes, in the whole territory of the United States, to the full end of the term for which said letters patent were granted, subject to the conditions hereinafter named.

2d. In consideration of the license hereby granted, the party of the second part agrees to pay to each of the parties of the first part twenty-five cents (25 cts.) upon each and every moulded
387 rotary cutter manufactured and sold by said party of the second part to be used in trimming the fore-part edges of boot and shoe soles, whether made in accordance with the terms of the said patent of Orcutt or not; and said party of the second part further agrees to pay to each of the parties of the first part twenty-five cents (25 cts.) on each and every rotary cutter made and sold by said party of the second part to be used for trimming the edges of boot and shoe heels, except such cutters as are made by it in accordance with the terms of the patent granted to James H. Busell on the 19th day of November, A. D. 1878, and numbered 210,006, and adapted to trim the fore-part edges of boot and shoe soles, so long as the selling price of said cutters can be maintained at one dollar each above the actual net cost of manufacturing the same, and when, by the force of circumstances or competition in the trade beyond the control of said party of the second part, said cutters cannot be sold for one dollar each over and above the net cost of manufacturing the same the party of the second part agrees to pay to each of the parties of the first part, as a royalty upon each and every moulded rotary cutter manufactured and sold by said party of the second part to be used in trimming the fore-part edges of boot and

shoe soles, whether made in accordance with the terms of said patent of Orcutt or not, and upon all moulded rotary cutters manufactured by it to be used for trimming the edges of boot and shoe heels, except such cutters as are manufactured in accordance with the terms of the patent No. 210,006, granted to James H. Busell Nov. 19th, 1878, and adapted to trim fore-part edges of boot and shoe soles, a sum equal to one-quarter of the difference between the net cost of manufacturing each cutter and the selling price therefor, it being understood that the term "moulded cutter," as used in this instrument, is intended to apply to such cutters as are designed to cut a moulding upon the edge of the sole and are adapted to be sharpened by grinding the front radial or nearly radial face of each tooth of the cutter.

3d. It is further agreed by the party of the second part that it will keep correct books of account, in which shall be recorded the number and date of all moulded rotary cutters made and sold by said party of the second part to be used on fore-part edge-trimming machines, and all rotary cutters manufactured by said party of the second part to be used for trimming heels, which books shall
388 be open to the inspection of either of the parties of the first part or their legally authorized agent or agents at all reasonable times.

4th. The party of the second part further agrees to make returns to the parties of the first part on the first days of January, April, July, and October of each and every year of all moulded rotary cutters manufactured by it for use in trimming sole edges and heels, and within thirty days after said first days of January, April, July, and October to pay over to said parties of the first part or their legal representatives all the royalties accrued and due said parties of the first part for cutters manufactured and sold during the preceding three months, as provided in article second of this agreement.

5th. It is further agreed by and between the parties hereto that in case of infringement of the said patent of Orcutt by other parties or in case of suits for infringement being brought against said Orcutt's patent the parties of the first part shall sign all necessary papers to enable the party of the second part to prosecute suits against all infringers and to defend said patent against suits for infringements whenever, in the judgment of the party of the second part, it is advisable to do so, and the said party of the second part agrees to pay all expenses of said suits without cost to the parties of the first part.

6th. Upon failure of the party of the second part to make returns or payment of license fees as herein provided for thirty days after the days herein named for making such returns and payment, or upon failure of said party of the second part to use all reasonable exertions to manufacture and keep on sale such cutters in quantities sufficient to supply the reasonable demands of the public therefor, the parties of the first part may terminate this license by serving a written notice upon the party of the second part; and it is also agreed that whenever, from the force of circumstances or legitimate

competition in the trade beyond the control of the party of the second part, the selling price of said cutters cannot be maintained at one dollar each above the actual net cost of manufacturing the same, it shall be optional with the parties of the first part to accept a reduced royalty or terminate this license, which they may do by giving sixty days' notice in writing to the party of the second part, but the party of the second part shall not thereby be discharged from any liability to the parties of the first part for any license fees which may be due to said parties of the first part at the time of the service of either of said notices.

389 In witness whereof the parties have hereunto set their names and affixed their seals, the Busell Edge Trimmer Company by its president and treasurer, this twenty-first day of January, A. D. 1880.

O. L. NOBLE, *President.*
S. H. HOWE, *Treasurer.*
W. D. ORCUTT. [SEAL.]
J. H. BUSELL. [SEAL.]

In presence of—
J. E. HORR.

BOSTON, *Feb. 12th*, 1880.

For value received the Busell Edge Trimmer Co. of Boston hereby assigns and conveys to the Busell Trimmer Co. of Nashua, N. H., all its right, title, and interest to the within license.

BUSELL EDGE TRIMMER CO.,
By O. L. NOBLE, *President.* [SEAL.]
S. H. HOWE, *Treasurer.*

In presence of—
HOMER ROGERS.

Received for record August 27, 1881, and recorded in Liber T[26], page 390, of Transfers of Patents.

In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

[SEAL.] E. W. MARBLE,
Commissioner.

COMPLAINANTS' EXHIBIT LICENSE 2. W. A. C., Sp'l Ex'r.

Whereas an agreement between Wm. D. Orcutt and James H. Busell, both of Boston, and the Busell Edge Trimmer Company, a Massachusetts corporation, was made on or about December 1st, 1879, relating to the exclusive right under letters patent No. 212,971, dated March 4th, 1879, granted to said Orcutt for rotary cutter for sole edges, which agreement is recorded — Liber A[25], page 159, of Transfers of Patents, and has since been assigned to and conveyed to the Busell Trimmer Company of Nashua, New Hampshire, a corporation under the laws of the State of New Hampshire;

390 And whereas said Orcutt has an application for letters patent for improved rotary cutter for sole edges now pending in

the United States Patent Office, filed on or about January 6th, 1879:

Now, it is mutually agreed as follows by and between said Orcutt and said Busell Trimmer Company:

First. The said application and any letters patent which may be granted thereon and the invention therein described are included in said agreement above mentioned in all respects precisely as if the articles of said agreement referred in terms to said invention, application, and letters patent, as well as to the patent No. 212,971 and the invention therein described.

Second. The Busell Trimmer Company shall bear all expenses of reviving and prosecuting said application, and agree and bind themselves to do all that may be fairly done to obtain a patent thereon free of expense to said Orcutt, Orcutt to execute all necessary papers for that purpose.

Executed in duplicate this twentieth day of December, 1880.

J. H. BUSELL.
WM. D. ORCUTT.
BUSELL TRIMMER CO.,
By O. L. NOBLE,
Superintendent.

Witness:
WM. A. MACLEOD,
To W. D. O.

Received for record August 27, 1881, and recorded in Liber T[26], page 394, of Transfers of Patents.

In testimony whereof I have caused the seal of the Patent Office to be hereunto affixed.

[SEAL.] V. D. STORKBRIDGE,
Acting Commissioner.

391 *Evidence for Complainants.*

Taken pursuant to the 67th rule of the Supreme Court of the United States, in equity, as amended, before me, William A. Copeland, special examiner.

Present: J. E. Maynadier, Esq., of counsel for complainants; T. W. Porter, Esq., of counsel for defendants.

Deposition of Edward H. Parks.

BOSTON, *May* 2, 1882.

Direct examination by J. E. MAYNADIER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Edward H. Parks; 44; Providence, R. I.; I am now with the Brown & Sharpe Manufacturing Co. as mechanical engineer.

Int. 2. How long have you been a mechanical engineer, and what special experience have you had in the manufacture of rotary cutters?

Ans. I have been in that capacity for the past three years—well, previous to that; I have been with them longer than that. For thirteen years previous to that I was foreman in the shop there, and my experience extended over that time. My experience has been during the time I was foreman there with all the different kinds of cutters manufactured in the shop—nearly all.

Int. 3. Please look at the thing now shown you (now put in evidence and marked Complainants' Exhibit Brown Patent Gear Cutter, W. A. C., sp'l ex'r), and state what it is and how long you have been familiar with its manufacture and use.

Ans. It is a gear-cutter made by the Brown & Sharpe Manufacturing Co. I have been familiar with its manufacture and use for about sixteen years.

392 Int. 4. Please look at the patent now shown you, No. 45294, granted to Joseph R. Brown, dated Nov. 29, 1864 (a copy of which is now put in evidence and marked Complainants' Exhibit Brown Gear Cutter Patent, W. A. C., sp'l ex'r), and state how long you have been familiar with that patent and how the thing described in it resembles or differs from the Exhibit Brown Patent Gear Cutter.

Ans. I have been familiar with it for about sixteen years. There is no difference that I can see from the thing described in the patent—practically no difference. There is a difference in the manner of making from the manner shown there; the result is the same.

Int. 5. Please look at the patent now shown you, No. 238,303, granted to William D. Orcutt March 1, 1881 (now put in evidence and marked Complainants' Exhibit Complainants' Patent, W. A. C., sp'l ex'r), and state whether you are familiar with it and when you first had anything to do with the manufacture of cutters for trimming sole edges such as are described in it.

Ans. Well, I am not very much familiar with it. I have never seen it until within a short time. I should say the idea I meant to convey was that I had never read the patent until within a short time. (To the last part:) Well, to the best of my recollection, I should place it at some time within nearly three years.

Int. 6. Do you mean some time in the spring of 1879?

Ans. Well, I am not prepared to state whether it was in the spring. I should place it in 1879.

Int. 7. How did you happen to make these cutters for trimming sole edges? Please state the circumstances.

Ans. From the application of Mr. O. L. Noble, of the Busell Trimmer Co., for whom we were doing work then. He brought the forms there at various times for that purpose.

Int. 8. What cutters have you ever seen prior to making these cutters for Mr. Noble or the Busell Trimmer Co. which are nearest like, in your opinion, to the cutter shown in the complainants' patent? Please produce samples of one or two of them and state when and where and by whom such cutters were manufactured.

Ans. I know of none that are like it. It is a difficult matter to say which is the nearest like it. They are dissimilar in shape. It

is difficult to say which is nearest. Perhaps that one or these
393 two (now put in evidence and marked Complainants' Exhibits Brown & Sharpe Milling Cutter 1 and Milling Cutter 2, W. A. C., sp'l ex'r). They were made by the Brown & Sharpe Manufacturing Co. for the Providence Tool Co. We made them at various times during the time the Providence Tool Co. was making arms for the Turkish Government, say five years ago.

Int. 9. What work were these cutters for—Exhibits Milling Cutter 1 and Milling Cutter 2?

Ans. Milling gun parts.

Int. 10. What are the substantial differences between these milling cutters 1 and 2 and the sole-edge trimming cutter described in complainants' patent, in your opinion, disregarding as immaterial, for the purposes of this case, the especial way in which the blades are secured to the hub in complainants' patent?

(Objected to for the reason that the question assumes that there are substantial differences, which is a question for the witness to decide by his answer, so far as he can do so.)

Ans. Well, the difference is wholly in the shape, I should say.

Int. 11. Please explain a little more fully your opinion on this point by reference to the drawing of the patent and the letters of reference.

Ans. Well, I should say it has no thin edge here which would enable to trim a shoe sole with it.

Int. 12. Please explain what you refer to by the term "thin edge."

Ans. I mean the projecting portion or the edge, the large portion of the extreme edge of this cutter, Exhibit Milling Cutter 1. (The magistrate lost a portion of answer, and witness says:) I don't know now as I can repeat what I said. I will call it in the phraseology here (reading from complainants' patent): "The ridge at the side of the cutter is too thick to be used for trimming sole edges." That is my opinion.

Int. 13. Please refer to the complainants' patent, and if you find what you call the thin edge in the drawing of that patent say how it is marked.

Ans. If I find the thin edge on the cutter—is that the way you understand it? I am asking a question now. (Magistrate re-reads the question.) It is marked 1.

394 Int. 14. Look at the cutter now shown you (put in evidence and marked Complainants' Exhibit Defendants' Cutter, W. A. C., sp'l ex'r) and state whether it is the same thing shown in the complainants' patent or not, in your opinion.

Ans. I should think it was.

Cross-examination by T. W. PORTER, Esq., of counsel for defendants:

Cross-int. 15. Please examine said Brown gear-cutter patent and Exhibit Complainants' Patent and the Exhibit Defendants' Cutter and state what differences, if any, you find between said defendants' cutter and that shown in complainants' patent except the outline of

said defendants' cutter and that shown in complainants' patent, which outline is marked in complainants' patent 1, 2, and C, when compared with the cutter shown in Exhibit Brown Gear Cutter Patent.

(Objected to as unintelligible.)

Ans. I find no difference.

Cross-int 16. During the time that you have been engaged in making the Brown patent cutter, as you have stated, has it not been the practice for said Brown & Sharpe to make to order cutters embodying the peculiar features shown in said Brown gear-cutter patent, but with great varieties of outline, as the same might be ordered?

Ans. It has.

Cross-int. 17. Would there be any difficulty or need of unusual skill in making cutters embodying the peculiar features of said Brown gear-cutter with an outline or face adapted to trim the edges of shoe soles so as to give any desired configuration to the edges thereof?

Ans. There would not.

Cross-int. 18. Has it or not been the practice during the time in which you have been acquainted with gear-cutters, as stated, to make cutters in gangs or sections, instead of in one entire piece, whenever a saving could be effected or for other reasons?

Ans. It has.

Cross-int. 19. In your judgment, based upon your experience, would there be any substantial difference between a cutter made in one piece, like Complainants' Exhibit Defendants' Cutter, and
395 a cutter made with the parts shown in complainants' patents at 1, 2, and C made separate from each other?

Ans. I should say there would be a substantial difference in the construction.

Cross-int. 20. Would such difference in construction consist in anything except that one cutter is made in three pieces and the other in one?

Ans. I should think that would be all the difference in construction, possibly, but a cutter might be produced of the same form of three separate pieces.

Cross-int. 21. If you were furnished with a shoe having any form of outline of sole edge would it not be within the skill of your workmen employed upon cutters to readily construct a cutter which would conform to such sole edge and which would cut a duplicate of the same?

Ans. It would.

Direct resumed:

Int. 22. What is the purpose of the metal with the cylindrical periphery at the larger diameter of Brown & Sharpe milling-cutter 1 and on both sides of Brown & Sharpe milling-cutter 2?

Ans. If I understand the question correctly, it is to give greater strength to the cutting edge of the teeth.

E. H. PARKS.

Attest: WM. A. COPELAND,
Special Examiner.

(It is admitted that Complainants' Exhibit Defendants' Cutter is one of the cutters manufactured by the defendants since the date of the patent and before the filing of the bill and such as they now manufacture and sell.)

WM. A. COPELAND,
Special Examiner.

396 *Deposition of Oscar L. Noble.*

BOSTON, *May* 2, 1882.

Direct examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Oscar L. Noble; over 50; Boston; I am superintendent of the Busell Trimmer Co.

Int. 2. Are you familiar with the patent now shown you, marked Exhibit Complainants' Patent?

Ans. Yes; I am.

Int. 3. Where were the first cutters, such as is described in that patent, made?

Ans. At the shop of Warren Haskell & Co., Charlestown street, Boston.

Int. 4. What did you have to do, if anything, with getting them made by the Brown & Sharpe Manufacturing Company?

Ans. I went to them with rough drafts of forms that I wanted and templates filed up in form, and engaged them to make cutters in similar forms.

Int. 5. When was this and about how long after you had them made at Warren Haskell & Co.'s?

Ans. Well, it was between Jan. 1 and March 1 of 1879. I couldn't tell the exact date, and I couldn't say how long after the others; to the best of recollection, though, I should think about six months.

Int. 6. What were the circumstances that led you to have the cutters manufactured by the Brown & Sharpe Manufacturing Co.?

Ans. We were short of facilities for manufacturing them at Warren Haskell & Co.'s shop, and to a limited extent I thought them like the Brown & Sharpe cutter.

Int. 7. Did you then know anything about the Brown gear-cutter patent of 1864, and what is your opinion as to the Orcutt cutter being an infringement upon that patent?

Ans. I did know of the Brown patent, and I thought there were some features of it that the Orcutt cutter infringed.

397 Int. 8. What had been your experience prior to 1879 in trimming boot and shoe soles, and what was the main trouble with all the machines then in the market for that purpose?

Ans. I had been familiar with shoe-trimming on what was called the Coté trimmer, and with the use of cutters commonly called the Coté or burr-cutter from 1875, and the principal difficulty, the inability to trim anything but straight or concave edges, or to take out the welt or rand at the same operation.

Int. 9. What has been your main business since 1875?

Ans. The developing the art of trimming shoe soles with machinery.

Int. 10. Please explain what taking out the welt or rand is and how it was done, so far as you know or ever have heard or have any reason whatever to believe, before the date of the Tayman patent.

(A copy of which is now put in evidence and marked Complainants' Exhibit Tayman Patent, W. A. C., sp'l ex'r.)

Ans. It is removing that portion of the sole on the top and nearest the upper, and was usually done with a hand knife or rand file and without the aid of machinery.

Int. 11. Is it always done as a part of the trimming of the sole edge, or only done now and then?

Ans. I think it is always done.

(Noon recess.)

Int. 12. What is the first rotary welt-cutter that you ever knew or heard of or have any reason whatever to believe existed?

Ans. The Tayman is the first one that I ever knew of.

Int. 13. And when did you first know or hear of a rotary welt knife in one piece with the rest of the cutter for trimming sole edges—that is, what is the first cutter embodying that feature known to you, or which you have any reason whatever to believe existed?

Ans. Between August, 1878, and January, 1879, the cutter known as the Orcutt cutter.

Int. 14. Please explain, as briefly as you can consistent with a full and proper explanation, the practical value in the art of trimming sole edges of the invention described in the complainants' patent, by contrasting, for example, that art as it was before the Orcutt cutters were used and as it was after they came into general
398 use. Before answering this question state what cutters are now commonly used in trimming sole edges and how long such cutters have been in common use.

Ans. The Orcutt cutter has been in common and very general use since the spring of 1879. Prior to the use of the Orcutt cutter the rand or welt was taken out by hand before the edge was trimmed on a rotary cutter, except to a limited extent, and I think only experimentally with the cutters constructed substantially after that described in the Tayman patent, and I do not know of any practical work being done in a manner acceptable to the trade wherein the edge and welt were simultaneously trimmed, before the introduction of the Orcutt cutter. I know of many experiments with welt knife and cutter combined that did the work ineffectually, but

all practical trimmers would only trim the edge of the sole straight or concave.

Int. 15. What is the field for edge-trimmers with the Orcutt cutters as compared with the field for the same trimmers with the best cutter known before Orcutt's invention?

Ans. With the Orcutt cutters there are no edges in use for shoe soles that I know of that may not be trimmed by the use of the Orcutt cutter, while with the best known cutters prior to the Orcutt the common and coarser qualities of work were only done.

Int. 16. Please give as clear an idea as you can as to how much the field is increased.

Ans. I should say four times.

Int. 17. And what is the saving generally in that class of shoes capable of being trimmed by the Orcutt cutter from the use of an edge-trimmer as compared with the saving from the use of edge-trimmers on that class of shoes which you call "the common and coarser qualities?"

(Objected to for the reason that it does not appear that the witness is acquainted with the shoe manufacturing business or the relative cost of the two methods of trimming inquired about or the cost of either.)

Ans. In regard to the common class of work, one man with the ordinary machines in use without the Orcutt cutter, but with the best cutters known aside from that, would perform as much work as four men by hand or hand tools, while with the use of the Orcutt cutter on the same class of work they would accomplish
399 about the same number of pairs per day and produce much better edges, and on the better class of work, which could not be done at all with the common cutter, their production would bear about the same proportion to a hand workman, but make a greater percentage of saving, from the fact that the hand price or price of hand work on that class of hand edges is much higher than it is on the common work; as, for instance, common work that would cost by hand fifty to ninety cents per case of sixty pair can be done from twenty to thirty cents per case, and on the better classes of work, that which costs from twenty-five cents to one dollar per case of twelve pair, can be done from seven to forty cents per case, and the organism of the shop is so arranged that there is much saving accomplished by passing through greater quantities of work.

Int. 18. What knowledge had you, if any, before the Orcutt invention of cutters substantially the same as either of these, Exhibits Brown Patent Gear Cutter and Brown & Sharpe Milling Cutter 1 and 2?

Ans. I have been familiar for ten years past with the cutter marked Brown Patent Gear Cutter, and first saw those marked Brown & Sharpe Milling Cutter 1 and 2 in the spring of 1879.

Int. 19. Did you make any investigation about that time to ascertain how near any of the Brown & Sharpe milling-cutters came in shape to the Orcutt cutter? If so, state how many different styles

of Brown & Sharpe milling-cutters you saw, and which of them were nearest, in your opinion, to the Orcutt cutter.

Ans. I did make investigation and found quite a number; I can't say how many. I will say from twelve to twenty. That is probably as many cutters as I saw during the investigation, and those marked Brown & Sharpe Milling Cutter 1 and 2 are the nearest of any I could find.

Int. 20. What substantial differences are there between Exhibits Brown & Sharpe Milling Cutter 1 and 2 and the cutter described in the Orcutt patent, disregarding as immaterial in this case the especial way in which the blades are affixed to the hub?

Ans. They cannot be used for the same purpose as the Orcutt cutter from the fact that they are not adapted to the trimming
400 of sole edges, and cannot be made to run between the sole and upper if combined with a rand guide, as they must be for that use.

Int. 21. Please consider in detail the likenesses and differences between the Orcutt cutter and Exhibits Brown & Sharpe Milling Cutter 1 and 2 and state whether the blades in both have or have not a flat front face, *a*, a flat rear face, *b*, a top surface, *c*, a number of ridges, one of which, marked 1 in the drawings, is at the side of the cutter, and when in use next the rand guide takes out the rand or welt, and the others of which, marked 2 in the drawing, are small beading ridges—that is, state which of these elements of the Orcutt cutter are lacking, if any, in the Exhibits Brown & Sharpe Milling Cutter 1 and 2.

Ans. Well, I find in the Exhibit Brown & Sharpe Milling Cutter the flat front face *a*, the flat rear face *b*, and the top surface *c*. The ridge on the exhibit corresponding to the ridge 1 in the Orcutt cutter is too thick to adapt it for use in trimming sole edges when connected with a rand guide. I find other ridges substantially corresponding to ridges 2 in the Orcutt cutter, but differently disposed.

Int. 22. Do you think that those ridges which correspond to the ridges 2 are adapted for beading a sole edge practically? And state what is the practical limit to the depth of a bead in a sole edge.

Ans. I do not think the ridges are practical for beading in the exhibits. The practical limit of a bead is between a sixteenth and a thirty-second of an inch.

Int. 23. Now, please compare the cutter marked Exhibit Defendants' Cutter with the cutter described in complainant's patent and state what substantial difference, if any, you can see between them.

Ans. I don't see any material difference, sir.

(Adjourned.)

BOSTON, *May* 3, 1882.

Cross-examination by T. W. PORTER, Esq., of counsel for defendants:

Cross-int. 24. Do you know whether it is the practice to cut the rand and trim the edge of the sole at the same operation with a rotary cutter acting upon the rand and the sole edge at the same time or not?

Ans. It is the practice with the cutter known as the Orcutt
401 cutter, and I have seen such cutters as is shown in Complainants' Exhibit Defendants' Cutter used in the same way.

Cross-int. 25. In your preceding answer do you intend to make any distinction between the Orcutt cutter and the Complainants' Exhibit Defendants' Cutter; and, if so, why?

Ans. None, except that I am entirely familiar with the use of the Orcutt cutter, but have not seen all the cutters in use like the Complainants' Exhibit Defendants' Cutter, and they may be used differently.

Cross-int. 26. Do you or not know that where a cutter is employed for trimming sole edges like Complainants' Exhibit Defendants' Cutter that it is necessary and the usual practice to first take out the rand or welt or the main portion thereof by a hand tool or a rand-cutter on a separate shaft?

Ans. I do not know that to be the fact.

Cross-int. 27. Would there, in your opinion, be any substantial difference between a cutter having the parts represented at 1, 2, and C in complainants' patent, each made separate and adapted to coact together, and a cutter made in one entire piece, as shown in said patent? If so, please state wherein such difference would consist.

Ans. I think there would not.

Cross-int. 28. Is there not shown in said Complainants' Exhibit Brown Gear Cutter Patent and in the Exhibit Brown Patent Gear Cutter a flat front face, a slightly eccentric outer or peripheral end, the same as in the Orcutt cutter?

Ans. There is the same as shown at *a* and *c* in the drawings in Exhibit Complainants' patent.

Cross-int. 29. Is there not in the construction of the Brown Patent Gear Cutter the same facility for sharpening by grinding and in the same way as in the Orcutt cutter?

Ans. There is.

Cross-int. 30. Did not the Coté cutter, to which you referred in your answer to interrogatory 8 as having used in 1875, have the proper circumferential configuration to give the desired outline to the edge of the shoe sole?

Ans. It did when no other form was required than a straight or concave edge.

402 BOSTON, *May* 3, 1882.

Cross-int. 31. Is there not shown in Exhibit Tayman Patent a cutter adapted to both trim the edges of the sole and take out the rand or welt?

Ans. There is.

Cross-int. 32. Is the result produced by the Tayman cutter in any respect different from that produced by the Orcutt cutter, except that the outline of the finished edge is different when trimmed by the Orcutt cutter than if trimmed by the Tayman cutter? If you find any other difference please state in what it consists and how and why it is produced.

Ans. The two cutters being made to produce the same edge as to

outline would produce substantially the same work when both were new, but in the continued use of each the form of that edge would change from the sharpening of the Tayman cutter gradually until it was worn out, while in the use of the Orcutt cutter it can be sharpened many times and worn out without changing the outline of the work produced.

Cross-int. 33. Is there any difference between the Exhibit Brown Patent Gear Cutter and the cutter shown in the complainants' patent in the matter of the preservation of the form of the tooth as it is being worn away by the process of sharpening and in the facility for sharpening? If you find such difference please explain in what it consists.

Ans. There is no difference.

Cross-int. 34. Is there any difference between the cutter shown in the Tayman patent and the cutter in complainants' patent, except that in complainants' patent a deep groove is formed between the teeth, as in the Brown patent gear-cutter, to facilitate grinding and sharpening as you have stated? If you find such difference please state in what it consists.

Ans. Yes; I think there is the same difference that exists between an ordinary saw tooth designed to be sharpened on both back and front faces with a file, while in complainants' patent it is designed to be sharpened on the front face only and by the use of emery or grinding stone.

Cross-int. 35. Does not such means or facility for sharpening
403 result entirely from the deep groove formed between the teeth as in the Brown patent gear-cutter and as is supposed and stated in the preceding question?

Ans. It does not, from the fact that the Brown patent gear-cutter has the front flat face marked *a* and top surface *c*, as shown in complainants' patent, while they are not shown in the same relation to each other in the Tayman patent.

Direct resumed:

Int. 36. Please state whether there is or not in the Tayman cutter anything substantially the same as those ridges marked 2 in complainants' patent.

(Objected to for the reason that it is an attempt to reopen the direct examination out of time.)

Ans. There is not.

Int. 37. How does the Tayman cutter compare with the Orcutt cutter as to the number of varieties of styles of sole edge capable of being produced by each?

Ans. The Tayman cutter is limited to a straight edge, while the Orcutt cutter may be made to form any shape desired.

Int. 38. Please reconsider your answer and explain what difficulty there would be, if any, in making any of the ordinary plain edges with the Tayman cutter, and also explain more fully what you mean by "straight edge" in your last answer.

Ans. I see no great difficulty in constructing the Tayman cutter

to form an ordinary or straight edge, but if you change it materially from a straight edge the difficulty will be very great; and what I mean by "straight edge" is a straight line from side to side across the sole or slightly convex or concave, but limited in the extent of the convexity or concavity.

Cross-examination resumed:

Cross-int. 39. Does the capability of the Orcutt cutter to produce varieties of styles of sole edges, as you have stated in Int. 37, result from anything except that the teeth are sufficiently coarse—that is, sufficiently far apart to admit of the forming of a deep groove between the teeth in precisely the same manner as in the
404 Brown patent gear-cutter? If such facility in the Orcutt cutter results from any other cause please explain what it is.

Ans. I see no difference, except that the Orcutt cutter will trim on three sides of the edge at the same operation—that is, take out the rand or welt, trim the edge, and bevel the bottom of the sole at the same time—while the Brown patent gear-cutter would only form the edge.

Direct resumed:

Int. 40. I don't exactly understand what you mean by the Brown patent gear-cutter forming the edge. State what use, if any, could be made of Exhibit Brown Patent Gear Cutter on sole edges.

Ans. There could be no practical use made of it; but if a sole were trimmed with the Exhibit Brown Patent Gear Cutter its form would be shown in such edge, but would serve to spoil rather than finish the same.

Recross-examination:

Cross-int. 41. Please compare the cutter shown in complainants' patent with Exhibit Brown Patent Gear Cutter and state whether you find any difference whatever between the two except that the periphery or face of the Orcutt cutter is adapted to form by cutting one of the well-known styles of shoe-sole edges. If you find any other differences between said cutters please explain fully in what it consists.

Ans. I find the Brown patent gear-cutter is adapted to cut into and make a groove or path in the material to which it is applied which would in nowise serve to trim or finish a sole edge, while in the complainants' cutter it is adapted by its shape, as shown in ridge 1 and 2, to go between the sole and upper of a shoe and take out the welt, form a bead, and otherwise shape the sole as desired.

Cross-int. 42. In your preceding answer do you mean to be understood that there is or is not any other difference between the Orcutt cutter and the Brown patent gear-cutter except the form or outline of the path or figure which they will cut?

Ans. That is all the difference.

O. L. NOBLE.

Attest: WM. A. COPELAND,
Special Examiner.

405 *Deposition of William D. Orcutt.*

BOSTON, *May* 2, 1882.

Direct examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Wm. D. Orcutt; 43; Boston; machinist.

Int. 2. Are you the patentee in this patent (Exhibit Complainants' Patent)?

Ans. Yes, sir.

Int. 3. How long have you been a machinist and what has been the extent of your knowledge as to rotary cutters used by machinists during that time?

Ans. About twenty-four years; and for about seven years I have had more or less to do with rotary cutters.

Int. 4. How long have you known gear-cutters like this one (Exhibit Brown Patent Gear Cutter)?

Ans. About six years.

Int. 5. Did it ever occur to you that that cutter (Exhibit Brown Patent Gear Cutter) was substantially the same thing as that shown in your patent (Exhibit Complainants' Patent)?

(Objected to as immaterial.)

Ans. Yes. The main features of this are the same as the Orcutt.

Int. 6. What are the substantial differences between the two, in your opinion?

(Objected to as assuming that there are substantial differences.)

Ans. Well, this cutter (Brown patent gear cutter) differs from mine from the fact that this was made for milling iron and mine was made for trimming the edges of boot and shoe soles.

Int. 7. Are there any parts in the Brown patent gear-cutter substantially the same as those parts marked 1 and 2 in your patent, in your opinion?

Ans. There are not.

Int. 8. About when was it that you invented your cutter?

Ans. Somewhere about the summer of 1878; I think it was August—some time in August.

406 Int. 9. In the first one you made were the blades in one piece with the hub or inserted in grooves in the hub as shown in complainants' patent?

Ans. In the first one the blades were inserted in the hub.

Int. 10. How with the second one?

Ans. The second one the blades were cut in a solid disc. The blades and hub were all one piece.

Int. 11. What kind of rand knives were you familiar with before you made your rotary cutter?

Ans. Well, I believe we made a rand knife of a bar of steel with a knife on each end of it—a cutter on each end of the bar—which we used with a rand guide; then we made a disc; cut out sections of that disc, leaving four arms, with a cutter on the end of each arm, that also to be used in a rand guide; and there was one made in the shop where I worked that there was little cutters made in the rand guide itself. I have seen the hard rand knife that was used commonly.

Int. 12. When did you first have knowledge of the Tayman rotary rand-cutter shown in this patent (Exhibit Tayman Patent)?

Ans. Well, I think about two years ago.

Int. 13. How does the rand-cutter marked F^2 in that patent differ substantially, if at all, from the rotary rand-cutter forming a part of the rand-cutter described in your patent?

Ans. Well, this cutter he uses here (referring to Tayman patent) is what we call a burr-cutter—that is, it is made—the clearance given to it is the same as we make on any ordinary burr-cutter or burr-reamer. Being made in that way, it cannot be sharpened without changing its shape, and in my cutter it is made so that by grinding from the front face it does not change the shape.

Int. 14. Look at these two cutters (Exhibits Brown & Sharp Milling Cutters 1 and 2) and state whether there are any parts in them which are substantially the same as the parts marked 1 and 2 in your patent.

Ans. I should say there is not.

Int. 15. Can you tell from an examination of them what they are for?

Ans. Well, I should think they were for milling iron or other metal.

407 Int. 16. What is the purpose of the metal left at the side of each of the two curved cutting edges in this (Exhibit Brown & Sharp Milling Cutter)?

Ans. I should think to give strength to the sides of the cutter.

Int. 17. What is the rate of speed at which rotary cutters are ordinarily revolved in cutting metal and what is the usual rate in trimming sole edges?

Ans. Well, for milling metal it is usually less than one hundred revolutions per minute, and for trimming leather it has been found best to run seven or eight thousand per minute.

Int. 18. Can you see any substantial difference between this cutter (Defendants' Exhibit Defendants' Cutter) and the cutter described in your patent (Exhibit Complainants' Patent); if so, what is it?

Ans. This cutter (Defendants' Exhibit Defendants' Cutter) has but one ridge on the back here. That is all the difference I see.

Int. 19. What ridge do you refer to in your last answer—the beading ridge or the ridge for taking out the rand?

Ans. Well, the—my patent shows two ridges in the back part, marked 2.

(Question being re-read, witness says:) Ridge 2.

Int. 20. And what is the work done by the ridges marked 2 in your patent?

Ans. The ridges marked 2 in my patent form what is called a sunk channel on the bottom of the sole or lower edge.

Int. 21. And what does that little ridge next the ridge 1 do in your cutter?

Ans. Forms a bead in the upper edge.

Int. 22. And what does it do in this cutter (Exhibit Defendants' Cutter)?

Ans. It does the same thing, I should think.

Cross-examination by T. W. PORTER, Esq., of counsel for defendants:

Cross-int. 23. In answer to Int. 13 you state that the rand-cutter F^2 shown in the Tayman patent is what you call a burr-cutter; that the clearance is the same as upon a burr cutter or reamer; that being made in that way it cannot be sharpened without changing its shape; that your cutter is made so that by grinding from its front face it does not change its shape.

408 Please examine the Tayman patent and your own patent and state clearly and fully what difference you find therein as the ground for your said statement in your answer to Int. 13.

Ans. This tooth in the Tayman patent (marked F^2) is not so high in the back part of the tooth as it is at the front. It is shaped more like the tooth of a saw from the front to the back, so that when the tooth is half worn out it does not cut as deep or take out as much rand as it does when it is new, and, mine being of a parallel depth, it makes no difference to the depth by grinding away the tooth—that is, will take out as much rand when half worn out as it will when new.

Cross-int. 24. Are or are not the teeth shown in your patent represented as having a clearance, such as you have described in the preceding answer—that is, not so high at the back part of the teeth as at the front?

Ans. Well, from what we call the bed of the tooth it is just as high at the back part of the tooth as it is on the front. What I call the bed of the tooth is that part which trims across the edge of the sole.

Cross-int. 25. Will you please state whether the teeth shown and described in your patent have a clearance or not?

Ans. They do have a clearance.

Cross-int. 26. In what does their clearance consist? Please describe it.

Ans. The teeth, after being formed, are set into the hub straighter up than they were in the hub on which they were formed, thereby giving them a clearance.

Cross-int. 27. Does not such clearance as you have just referred to consist in the fact that the back of the tooth is lower than the front of the tooth—that is, the back of the tooth is some distance inside a circle which is coincident with the front edge of the tooth?

Ans. Yes, sir; the back edge of the tooth is lower—described in a smaller circle than the front edge.

Cross-int. 28. Does not the same condition result from the clearance in the teeth of the Tayman rand-cutter, marked F²—that is, are not the back of the teeth inside of a circle struck around at the front of the teeth?

409 Ans. They are inside of a circle, but are filed away so as not to be so high from the bed of the cutter as the front of the tooth.

(Adjourned.)

BOSTON, *May* 3, 1882.

Cross-int. 29. In one of your answers you have spoken of the relative velocity at which cutters are rotated when used upon leather and upon metal. Does the necessity for such differing velocities result from any cause except the difference in the hardness of the material upon which they are used? If, in your opinion, it results from any other cause, please explain what it is.

Ans. No; it does not.

Cross-int. 30. Is not the cutter marked Complainants' Exhibit Brown & Sharp Milling Cutter 1 equally as well adapted to trim the edge of the shoe sole as is the cutter shown in complainants' patent, provided its outline or the configuration of the path that it will cut was preferred by the user to that shown in complainants' patent?

Ans. No, sir.

Cross-int. 31. Please state why not.

Ans. It is too large in diameter.

Cross-int. 32. Is that the only difficulty? If not, state what other.

Ans. Yes; I don't see any other.

Cross-int. 33. How many styles or forms of outline of edges of shoe soles do you know of each of which would require a different configuration of cutter to form them?

Ans. Well, I should say five or six hundred.

Cross-int. 34. If a cutter was formed with the straight front face *a* and back face *b*, and with the outer face *c* slightly eccentric, as shown and described in your patent, but with said face *c* formed to cut a convex instead of a concave edge to the sole, would it, in your judgment, be substantially the same as your cutter—that is, would such a cutter, if made by the defendant, infringe your patent?

(Objected to as a question of law, and also because the hypothetical cutter is not definitely described.)

Ans. I think it would.

410 Cross-int. 35. Would, in your judgment, each of the cutters formed to cut the five or six hundred varieties or styles of sole edges mentioned by you, if provided with teeth having a flat front face, *a*, a back face, *b*, and an upper or outer face slightly eccentric, as stated in your patent, be substantially like the cutter shown in your patent?

Ans. The cutters would be substantially the same with the face *c* to cut the different styles.

Cross-int. 36. If cutters can be thus formed to cut five or six hundred outlines of shoe-sole edges and yet be substantially like your cutter, why would not a cutter like Exhibit Brown & Sharpe Milling Cutter 1 be substantially like your patent if made of a diameter adapted to cut a sole edge?

Ans. Because it lacks the ridges 1 and 2, as shown in my cutter, for the purpose of taking out the welt or bead, which ridges form a part of nearly if not all shoe-sole edges.

Cross-int. 37. Do all of the different cutters employed in cutting said five or six hundred sole edges have the ridges 1 and 2 on them?

Ans. They all have one or both ridges that I have ever seen in use.

Cross-int. 38. When they have but one ridge, as you have just stated, is it not a ridge adapted to perform just what is performed by the cutter F^2 in the Tayman patent?

Ans. No.

Cross-int. 39. What does such single ridge in your cutter accomplish different from what is accomplished by the cutter F^2 in the Tayman patent?

Ans. It sometimes cuts a little bead along the upper edge; sometimes what is called a sunk channel at the bottom edge.

Cross-int. 40. Were not such beads and sunk channel old and well known and made by a great variety of tools long before the date of your invention?

Ans. They were known to exist in the edge of the sole, but not in a rotary cutter.

Cross-int. 41. Is there not shown in the Exhibit Brown Patent Gear Cutter the front flat face *a*, the back face *b*, and the top or outer eccentric face *c*, as in the cutter shown in your patent, and is there any difference between said Brown patent gear-cutter and your cutter, except that the outline of the outer face of the teeth of
411 your cutter are, or may be, shaped to cut any of the five or six hundred styles of sole edges which you have referred to?

Ans. I don't really understand that. (Question being re-read.) There is no material difference, as I said in an answer before, except that my cutter is adapted to trimming sole edges, and the Brown Patent Gear Cutter, as made for a gear-cutter, would spoil the edge of a shoe.

Cross-int. 42. If at the date of your invention a person had brought you a piece of metal having an outline like the shoe-sole edge shown below the cutter tooth *d*, in figure 4 in the drawings of your patent, could not any person of ordinary experience in making cutters have made a cutter without difficulty to cut that precise form?

Ans. Yes; they could, but in making that cutter they would have made what is called the ridge 1 in my cutter thicker or stronger, so as to enable it to stand the cutting of the metal without fracture to the cutter. When being made thicker for that purpose it would not be adapted to trimming of boots and shoes, because it would not go sufficiently deep between the sole and upper to produce a nicely trimmed edge.

Cross-int. 43. Were not sole edges having the outline shown as

being formed by the cutter in figure 4 of the drawings in your patent old and well known at the date of your alleged invention?

Ans. Figure 4 in my patent represents a molded edge of leather, and I believe molded edges on boots and shoes was patented some a long time ago. I have been informed so.

Cross-int. 44. If a cutter had been formed as stated by you in answer to cross-int. 42, would it not, with the exception of the thickness of the ridge which you have described, have been equally well adapted to trimming the edges of shoe soles as of trimming metal? And, if not, please state why not.

Ans. Excepting the thickness of the ridge, yes, sir, if I understand the cutter mentioned in cross-int. 42.

(Adjourned.)

BOSTON, *May* 4, 1882.

Cross-int. 45. In view of your last answer and of the answer to Int. 42, was there anything in your cutter different from pre-
412 vious and well-known milling-cutters, except that the ridge 1 was adapted to enter between the sole and upper in precisely the same manner as does the cutter F^2 in the Tayman patent?

Ans. There was. The slot between the teeth was cut deeper to enable the operator to more nicely grind the cutter—sharpen it.

In ordinary burr milling-cutters there is no such slot, and the usual way of grinding—sharpening such cutters—was by grinding away the outer face.

Cross-int. 46. Please consider your last answer and state whether in speaking of the slot between the teeth to facilitate grinding you mean to be understood as saying that there is a slot between the teeth in your cutter different from that shown in the Brown patent and Brown patent gear-cutter.

Ans. The slot in my cutter is deeper, so that the emery wheel in grinding passes below the inner edge of the front face and you get a nicer ground cutter. It keeps the face ground up more squarely.

Cross-int. 47. Please examine your patent and state whether you find anything therein referring to the matter of forming the slots between the teeth below the front face thereof, as referred to in your last answer; and, if so, state what it is.

Ans. I find nothing here referring to such slots.

Cross-int. 48. Has it not been the constant practice in making your cutters to form them from one piece of metal and with the front face *a* of the teeth extending to the bottom of the slot between the teeth in the same manner as shown in the Brown patent and the Brown patent gear-cutter?

Ans. It has not. The front face of the tooth that we sharpen does not extend to the bottom of the slot.

Cross-int. 49. Do you mean to state in the preceding answer that the cutters made by the Busell Trimmer Co. and by the defendant company, as shown by the Exhibit Defendants' Cutter now shown to you, are not formed with the front face *a* extending to the bottom of the slot between the teeth and the same as the Brown patent gear-cutter?

Ans. The front face of the teeth of the cutters now made by the Busell Trimmer Co. do not extend to the bottom of the slot, and in this defendants' cutter it does extend to the bottom of the slot.

413 & 414 Cross-int. 50. In your answer to Int. 45 you state that the usual way of grinding or sharpening burr milling-cutters was by grinding away the outer face. Are you not aware that such cutters are most usually and readily sharpened by filing the front face of the teeth and gradually deepening the same as the tooth is worn back, and that such mode of sharpening differs only from the mode of sharpening your cutter and the Brown patent gear-cutter in the use of the file in one case and the emery wheel in the other?

Ans. In all my experience in burr milling-cutters it has been considered the better way, when possible, to grind away the outer face, being done much more readily and cheaply. If sharpened by filing away the front face the cutter has to be softened, and, when sharpened, rehardened, which usually destroys the cutter by two or three such operations, the cutter being very liable to crack in rehardening. The method of grinding away the outer face can be repeated a much greater number of times.

WM. D. ORCUTT.

Attest: WM. A. COPELAND,
Special Examiner.

(Complainants' counsel here puts in evidence an original agreement between William D. Orcutt, James H. Busell, and the Busell Edge Trimmer Company, dated Dec. 1, 1879, recorded in the United States Patent Office, Liber T[26], page 390, and marked Complainants' Exhibit License 1, W. A. C., sp'l ex'r, and an agreement between J. H. Busell, William D. Orcutt, and the Busell Trimmer Company, dated December 20, 1880, recorded in the United States Patent Office, Liber T[26], page 394, and marked Complainants' Exhibit License 2, W. A. C., sp'l ex'r.)

415 *Evidence for Defendants.*

Taken pursuant to the 67th rule of the Supreme Court of the United States, in equity, as amended, before me, Eugene Humphrey, special examiner.

Present: J. E. Maynadier, Esq., of counsel for complainants; T. W. Porter, Esq., of counsel for defendants.

Deposition of Moses C. Johnson.

BOSTON, *August* 25, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Please state your name, age, residence, and occupation.

Ans. Moses C. Johnson; 38; Hartford, Conn.; machinist.

Int. 2. Have you had any experience with patented and other

inventions, either as inventor as otherwise? If so, please state briefly the extent thereof.

Ans. I have. I have taken out some half a dozen patents, in form of chuck-jaws, friction-clutch pulleys, cutting dies, or hollow mills, taps, &c.

Int. 3. Please state briefly the machinery manufacturing establishments in which you have been engaged and the length of time in which you were so engaged.

Ans. I have been in machine business twenty-two years; served my time with the Pratt & Whitney Company, Hartford, Conn. After serving my time I worked for them as contractor; also have had charge of the tool work; have made tool work a specialty the largest part of my time for twenty-two years; have also worked for the Cooper Fire Arms Co. of Frankfort or Philadelphia; also for the Industrial Iron Works of Philadelphia, the American Buttonhole Sewing Machine Co. of Philadelphia, Worcester Street Armory of New York, the Morse Twist Drill and Machine Co. of New
416 Bedford, Mass.; the Billings & Spencer Company of Hartford, Conn., and Dwight Slate, of Hartford.

Int. 4. Have you examined the letters patent number 54294, issued to J. R. Brown, Nov. 29, 1864, the same being filed in this case as "Complainants' Exhibit Brown Gear Cutter Patent," and do you understand the same?

Ans. I have and do understand it.

Int. 5. Have you known of the making and use of cutters embodying the essential features of said Brown patent? And, if so, please state the uses to which they were applied and the extent, if any, of variations of the contour or outline of the peripheral surface which was given to such cutters.

Ans. I have known of the making and use of such cutters; have known them to be used in gun and sewing machine work. It would be hard to state any shape that they haven't cut or milled with such cutters.

Int. 6. Would it or not, in your judgment based upon your experience, be within the scope of the skill of any one of ordinary experience in making cutters to make cutters similar to that shown in said Brown patent, and adapted to cut any form or outline of which a drawing or pattern was furnished, and which was within the scope of a rotating cutter?

(Objected to as incompetent and immaterial.)

Ans. I think it would.

Int. 7. Have you examined the United States patent No. 238,303, issued to William D. Orcutt March 1, 1881, and filed as an exhibit in this case, and do you understand the thing described therein?

Ans. I have examined and do understand the same.

(Counsel for defendants here puts in evidence copy of letters patent No. 212,971, issued to Wm. D. Orcutt March 4, 1879, and marked "Defendants' Exhibit Orcutt Patent 1879, E. H., sp'l ex'r.")

Int. 8. Have you examined United States patent No. 212,971, and do you understand the thing therein described and claimed?

Ans. I have examined and do understand it.

Int. 9. Please compare said two Orcutt patents and state what similarities and dissimilarities, if any, you find in the things therein shown and described.

417 Ans. There is no material difference that I can see.

(Counsel for defendants here puts in evidence a cutter marked heretofore "Dunham Edge Cutter Exhibit, E. H., N., P," and now re-marked "Dunham Edge Cutter, E. H., sp'l ex'r;" also a cutter marked "Exhibit Snell and Atherton Cutter, E. H., sp'l ex'r.")

Int. 10. Please examine the Exhibit "Dunham Edge Cutter," now shown you, and state wherein, if at all, it is similar or dissimilar to the cutter shown and described in the Exhibit "Complainants' Patent."

Ans. The molded or fancy top surface is very similar to his specification. One was intended for a rotary cutter, the other for a reciprocating, I should think.

Int. 11. Please examine the Exhibit Snell and Atherton Cutter with Exhibit "Complainants' Patent" and state the similarities or dissimilarities, if any, which you find therein with reference to their clearance, form of teeth, peripheral outline, etc.

Ans. The form of teeth in this exhibit is also very similar to the patent referred to. The clearance is obtained by the bending of the teeth back or rearwards from their cutting edges. This also seems to be a part of a circle, while his figure 1 represents a completed circle.

Int. 12. Please state whether you do or do not find in said "Exhibit Snell and Atherton Cutter" blades similar to blades *d*, shown and marked in "Exhibit Complainants' Patent," and which are provided with flat front faces *a* and have their outer or peripheral ends *c* molded throughout to a uniform shape the converse of a shoe-sole edge and slightly eccentric to a circle or line which would encounter the outward extremity or front edge of said cutters.

Ans. I do find such blades similar. They are provided with flat front faces *a* and have their ends *c* moulded throughout to a uniform shape. They have that appearance, of being eccentric.

Int. 13. Please state what substantial difference, if any, you find between said Exhibit Snell and Atherton Cutter and the cutter described and shown in Exhibit Complainants' Patent except that in complainants' cutter there is a hole, *d'*, for the shaft and the teeth are arranged around an entire circle, while in the Snell & Atherton cutter the teeth are arranged upon the arc of a circle and the cutter is not adapted to be mounted upon a shaft or arbor.

418 Ans. I don't see any material difference, only from the fact that the teeth can be removed in one case, whereas in the other they are all in one piece.

Int. 14. Has it or not been the practice, so far as your observation has extended, to form cutters embodying the essential features of the Exhibit Brown Gear Cutter, but with ridges or projections upon the

teeth as high and thin as the ridge shown at 1 in the drawings, Exhibit Complainants' Patent?

(Objected to as leading, also as immaterial, or else incompetent, the hypothetical Brown gear-cutter being altogether too vague.)

(Counsel for defendants states that he introduces said question with reference to the answer to cross-interrogatory 42 given by William D. Orcutt, complainant in this suit.)

Ans. It has been.

Int. 15. Is there any difficulty in using cutters so formed upon any metal or material to the cutting of which milling-cutters are usually applied?

Ans. I have never known any. It is possible they would not produce the number of parts milled with such cutter as would be produced with a cutter of wider or thicker edges.

Int. 16. Please state whether or not, in the course of your experience as a manufacturer and user of tools, it has been the practice with mechanics to make and use screw-taps, reamers, and other tools with a deep groove between the cutting teeth, with a freeing or clearance upon the teeth, and adapted to be sharpened by grinding the front of the teeth in the same manner as Exhibit Complainants' Cutter is adapted to be sharpened.

Ans. It has.

(Counsel for defendants here puts in evidence reissued letters patent No. 9073, granted to G. H. P. Flagg, assignee, Feb. 10, 1880, marked "Defendants' Exhibit Tayman Reissue, E. H., sp'l ex'r.")

Int. 17. Please examine Defendants' Exhibit Tayman Reissue and state whether, in your judgment, based upon your experience, the forming of "the rotary cutter F F^1 F^2, adapted to trim both the edge and the welt," as stated in claim 5 in said patent, in three pieces or sections, as shown in the drawings therein, is a common and well-known method of constructing similar cutters, and
419 whether the method of constructing cutters in sections or of one entire piece are not methods equally well known to machinists and tool-makers.

Ans. Yes; that is one of the methods of constructing cutters or mills for milling or cutting irregular forms or shapes that has been in use before my knowledge of milling. The method of constructing cutters in sections or gangs is a well-known method. I have known it ever since I have been in the trade. Constructing cutters of one piece is equally well known.

Int. 18. Please state whether or not during the past ten years or more the method of forming cutters of various peripheral outlines and with clearances of the teeth and a space between the teeth like that shown in Exhibit Brown Gear Cutter has not been as well known to machinists and tool-makers as the method of forming cutters with similar outlines and with teeth similar to those shown in cutter F F^1 F^2 in said Exhibit Tayman Reissue.

Ans. I should say it had.

(Counsel for defendants here puts in evidence certified copy of the 'file wrapper, contents, and drawing in the matter of the letters patent granted to Wm. D. Orcutt, March 1, 1881, No. 238,303," marked Def'ts' Exhibit Copy of File Wrapper and Contents, Orcutt patent, 1881, E. H., sp'l ex'r.)

(Noon recess. Adjourned to 1.45 p. m.)

(Met according to adjournment.)

(Defendants' counsel also puts in evidence a rotary cutter marked "Defendants' Exhibit Colt's Armory Cutter, E. H., sp'l ex'r.)

Int. 19. Please examine "Defendants' Exhibit Colt's Armory Cutter" and state whether or not cutters of the same or similar peripheral outline have been known and used in establishments where you have been employed for the last ten years or more.

Ans. Cutters similar to the exhibit, perhaps not exactly like this, have been in use, to my knowledge, for at least ten years.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 20. Do you know of your own knowledge or can you tell from inspection what particular article "Exhibit Colt's Armory Cutter" is designed to mill?

420 Ans. I could not.

Cross-int. 21. Why is it that the teeth of Exhibit Colt's Armory Cutter are backed off on one side?

Ans. The article being milled required that to be backed to give it clearance.

Cross-int. 22. You have said that the teeth in this tool—Exhibit Snell & Atherton Cutter—had a clearance, and that you thought such clearance was obtained by bending the teeth. Please examine the tool carefully and state whether you still think any of its teeth have been bent back; and, if you do, please state which you think have been bent back.

Ans. I still think the same—think they have all been bent back. I don't say that they have, but the tool has that appearance.

Cross-int. 23. It is not entirely clear what you mean by the teeth of that exhibit. Please state whether it has three, four, or five teeth, in your opinion.

Ans. I think it has four teeth—that is, cutting teeth or cutting edges or intended to cut.

Cross-int. 24. And do you believe that all four of those teeth were bent back to give clearance or for any other purpose?

Ans. I think they were. They are none of them bent uniform. If they had have been the spaces would be uniform now. Some have the appearance of being bent more than others.

Cross-int. 25. What do you think this triangular tooth without any cutting edge is for?

Ans. Probably to prevent the first tooth from digging into whatever was scraped or cut with this tool and getting it out of shape. That is my opinion. I never saw a tooth of this shape before.

Cross-int. 26. Do you mean as acting somewhat like the guard of a plane.

Ans. I should say acting more as a fulcrum to lift that that is back of it.

Cross-int. 27. Do you think that the largest tooth of the four has been bent back or has what you would call a clearance?

Ans. I should have my doubts about that's being bent. If it has it has probably been bent very slight.

Cross-int. 28. Please consider whether clearance does not
421 always exist in a reciprocating tool formed on the arc of a circle like this Snell & Atherton cutter—whether the blades are bent back or not—that is, assume a tool made just like the Exhibit Snell & Atherton Cutter, except that the periphery was turned in the arc of a true circle and the blades formed by removing the metal between, as in the exhibit, but without any bending back or any change of the periphery of the blades, and state if it — not clear to you that if the workman held the handle right he would get all the clearance required.

Ans. The mere fact of removing the stock, which process is what forms the tool, does not remove any stock from the periphery of the tooth immediately back of the cutting edge or what was intended for the cutting edge when the tool was made. When the cutting face stood exactly perpendicular from a horizontal plane one degree's variation would either make the tooth cut or prevent its cutting; in other words, would make it scrape.

Cross-int. 29. Don't you think, on the whole, that it is a mistake to talk about the clearance in the teeth of the Snell & Atherton cutter in the same sense in which you talk about the clearance in a rotary cutter having many teeth, like the cutter described in complainants' patent or Exhibit "Brown Gear Cutter?"

Ans. I don't understand what you mean by "the same sense."

Cross-int. 30. Do — think there is any clearance, as you understand that term, in this tool, "Exhibit Dunham Edge Cutter?"

Ans. I don't think it is cleared, like an ordinary gun-mill, in that sense, but it certainly has a clearance or it would not cut.

Cross-int. 31. Now, do you believe that the clearance in "Exhibit Colt's Armory Cutter" is like that in an ordinary gun-mill?

Ans. I think it is more on the plan of the Brown gear-cutter.

Cross-int. 32. How many cutting edges do you think cut during any one forward motion of Exhibit Snell & Atherton Cutter?

Ans. Probably if they were cutting around the outside of a circle there might not be but one tooth that would cut; don't see how there could be but one; if they should happen to get just the right inclination none of them would cut. If it was cutting on the inside of a circle of the same radius as the outside, the extreme outside edges of the teeth, all the teeth could be made to cut.

422 Cross-int. 33. What experience, if any, have you had with cutters for trimming sole edges?

Ans. Cannot say that I have had any direct experience with cutters for trimming sole edges; don't recollect that I have.

Cross-int. 34. Your 9th answer seems to me slightly wrong.

Please hear it read and then state whether you mean to be understood as being of the opinion that there is no difference between the method of manufacturing cutters described in one of the Orcutt patents and the article described in the other.

Ans. That may be a question where the counsel and myself might misunderstand each other as to my meaning.

Cross-int. 35. It seems to me very clear that the Exhibit Snell & Atherton Cutter is wholly unlike the thing described in complainants' patents. Please state whether you agree with me or not as to this.

Ans. I think I stated in my previous answers that one is a rotary, while the other would be reciprocating, which would make them wholly unlike.

Cross-int. 36. What do you believe to be the function of the ridges marked 1 and 2 in the cutter described in complainants' patent?

Ans. I should say for cutting some material.

Cross-int. 37. What is the ordinary speed at which cutters like these two are commonly run, in your experience—Exhibits Colt's Armory Cutter and Brown Patent Gear Cutter?

Ans. Somewhere in the neighborhood of forty feet per minute, depending upon the material being cut.

Cross-int. 38. Then if the circumference be a foot the cutter will revolve about forty times per minute?

Ans. Correct.

Direct resumed:

Int. 39. Please state the kinds of material in which the Exhibits Colt's Armory Cutter and Brown's Patent Gear Cutter are used when run at the rate of about forty feet per minute, as stated in your answers to cross-interrogatories 36 and 37.

423 Ans. Decarbonized steel and softly annealed tool steel, or any material of about that degree of temper.

MOSES C. JOHNSON.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Samuel N. Corthell.

BOSTON, *August* 28, 1882.

(Met at 1.30 p. m., according to adjournment.)

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Samuel N. Corthell; 39; Quincy, Mass.; salesman of shoe machinery.

Int. 2. Are you at present the agent of the defendant company?

Ans. I am.

Int. 3. Have you heretofore worked at boot and shoe manufactur-

ing? If so, when first, how long, and in what places and establishments and in what capacities? Please state fully.

Ans. I have. I suppose I worked at making shoes and parts thereof thirty years ago, and the most of the time—for twenty years—in J. L. Nash & Co.'s factory, at Center Abington; Henry Dunham's, at same place; Reed & Glosson, South Abington; Reed & Jones and W. V. Everson, same place; P. S. Leach, Lucius Leach, C. R. Ford, C. F. Porter & Co., and Porter & Southworth, at Brockton (formerly North Bridgewater); A. R. Jones & Co., of Boston, and before they had shoe factories I worked at home with my father at the same business. I have had contract jobs for certain parts of the work, such as trimming, setting, and finishing the edges of boots and shoes, in four or five different large factories.

Int. 4. Have you had experience in the manufacture and use of boot and shoe manufacturing machinery, and particularly of machinery adapted to finishing the edges of boots and shoes, and have you invented and patented machinery or tools therefor, and to what extent?

424 Ans. I have. For the past eight years the most of my time has been spent in improving and perfecting edge-trimmers and edge-setters. I have invented some five or six patents on edge setters and edge trimmers, cutters, and tools to be used on such machines.

Int. 5. When did you first know of the employment of rotary edge-trimmers having rotary cutters for finishing the sole edges of boots and shoes?

Ans. Some time in the winter of 1873 and 1874.

Int. 6. Have you heretofore been familiar with the use of shoe-sole edge-trimmers like the one now shown you, marked "Defendants' Exhibit Dunham Edge Cutter;" and, if so, when first, how long, and to what extent were they used?

Ans. I have seen them in general use since (that is, this and similar to this) 1858. They have been in general use ever since up to the present time.

Int. 7. Where and by whom were they manufactured?

Ans. They were manufactured by the Snells—Snell & Atherton—and similar tools by other parties, at North Bridgewater, now Brockton, Mass.

Int. 8. Please examine the edge-trimming tool marked "Exhibit Snell & Atherton Cutter," and state whether you have heretofore known such cutters and their use; and, if so, how long and how extensively were they used?

Ans. I have seen such cutters and cutters similar to this in use from 1858 to 1864, '5, and '6—most extensively used between 1850 and 1860.

Int. 9. Please state whether both these cutters (Exhibits Dunham Edge Cutter and Snell & Atherton Cutter) are adapted to cut or trim at the same time the edge of the sole, the bottom of the sole, to bring it to a uniform thickness, the rand, and to form a small bead on the corner of the sole next to the rand.

Ans. They are, to the same extent that any rotary or other hand tool, except the tool called the welt knife or rand knife.

Int. 10. Please explain what you understand to be the peculiar operation of a rand or welt knife, if any, from the operation of the rand-cutting ridge in said exhibits.

Ans. The rand knife or welt knife (a separate tool) is used
425 to take out the welt or upper portion of the edge at any required depth and to a certain extent to leave the sole as near a uniform thickness as possible. The lips on these two exhibits—Snell & Atherton Cutter and Dunham Edge Cutter—are to smooth up and cut the size and height of the lip at a certain degree of bevel, so that the iron that is made to follow these tools, the lip of the same degree and bevel, will polish or finish that portion the same as the bed of the iron will—that is, in ordinary cases.

Int. 11. State whether or not it is practical and usual with the use of the Exhibit Dunham Edge Cutter or the Snell & Atherton Cutter at the same time to trim the edge of the sole, to cut the rand, and cut away the bottom of the sole at the edge so as to reduce it to a uniform thickness.

Ans. It cuts a very small portion of the rand, but it is not the usual practice to cut in any case. I will say it is not the usual practice in any case to present these tools to the edge until the welt or rand or a portion thereof is removed by some of the well-known tools made for that purpose.

Int. 12. After a portion of the rand has been cut away, as you have just stated, does or not the Dunham edge-cutter or the Snell & Atherton cutter then operate to cut at the same time the remainder of the rand, the sole edge, and the bottom near the edge?

Ans. Yes; it does; but not but a small portion of the rand. It cuts all that is required to be cut of the rand.

Int. 13. Are you familiar with the rotary edge-trimming machines made and sold by the complainant, Busell Trimmer Company; and, if so, is the machine which they make and sell adapted to trim the welt or rand and the edge of the sole at one operation, or is it necessary to first take out the principal portion of the rand with a separate tool?

Ans. I am somewhat familiar with the Busell Company's trimmer. It is necessary, I should say, in nine cases out of ten where the Orcutt cutter is used, to take cut a portion of the welt or rand before presenting the edge of the machine. There are cases, on cheap, ordinary work, where they put onto the rand what they call a "stitch wheel," that the lip on the cutter will take off all the welt or rand required, and in some cases in hand-sewed or "fair-stitch"
work the lip will take off what is required; but in what is
426 called "first-class hand-sewed work" the rand or welt—the corner of the rand or welt portion thereof—is removed before it is placed into the shoe or boot.

Int. 14. Has there, to your knowledge, ever been any rotary edge-trimming machine which could with one cutter and at one operation and on all kinds of work trim the edge of the sole and cut out the rand completely?

Ans. There has not.

Int. 15. Are you the patentee named in United States letters patent No. 236,145?

(Copy of said patent now put in evidence and marked "Defen'ts' Exhibit Cortheil Patent, 1881," E. H., sp'l ex'r.)

Ans. I am.

Int. 16. Please state what is the object of the shafts marked respectively "B" and "D" and the cutters mounted thereon?

Ans. The shaft marked "D," with the cutter "*a*," is to remove that portion of the upper edge or rand that may be required to be removed. Shaft "B," with cutter "*b*," is to finish trimming the edge of the sole, with the exception of the shank, which is trimmed with the cutter marked "*a*."

Int. 17. With a machine and cutters constructed and arranged as shown in your exhibit patent can you trim the fore part of all kinds and qualities of boots and shoes?

Ans. I can, except on a very thin, delicate upper that has a very close edge, with a veneering of leather board or paper.

Int. 18. Is it practical to trim all the varieties and classes of work with a machine having but one cutter, and that made in one piece, like that shown in complainants' patent—that is, with a rand-cutter and edge-cutter connected, which can be trimmed with machines having the rand-cutter and edge-cutter upon separate shafts? And, if not, please state as near as you can the difference in the effectiveness of the two machines.

Ans. It is not. A machine with only one cutter, like the complainants', can't trim all kinds of work, for the reason that a large portion of the welt or rand in some cases has to be removed by some of the well-known tools for that purpose by hand. With a machine that has a welt knife on a separate shaft you can remove that portion of the welt or rand that would have to be done by hand with the other machine.

427 Int. 19. Please examine the exhibit filed in this case, marked "Compl'ts' Exhibit Defendants' Cutter," and state whether, in your opinion, it was made by the defendant company, of which you are agent, and state the object of the small ridge at one end or face thereof, as used in your machine with two shafts.

Ans. I should say it was made by defendants, and the small ridge is what we call a "bead." The outer ridge is what we call a "rand lip," and is used to cut or finish the edge of the rand, leaving it in the right shape to receive the iron to finish.

Int. 20. Do you or not know of cutters having been made at the shop of David Whittemore for O. L. Noble which were similar to the cutters shown in complainants' patent? And, if so, state by whom they were made, when, as near as you can, and the points of resemblance between them and the cutter shown in complainants' patent.

Ans. I do know of cutters being made for O. L. Noble or the Busell Company. I see one cutter that Mr. Stevens made. It resembled this cutter (Exhibit Complainants' Patent) in every respect,

except there were not so many teeth. It was some time in the fall of 1878, and, to my best recollection, the last of September or first of October.

Int. 21. Please examine the cutter marked "Defendants' Exhibit Thompson Rand and Sole Edge Trimmer," and state when you first saw the same.

Ans. The sleeve was first used in Whittemore's in the first part of the summer of 1877, with beveled knives, but we used it then set rigid, at different widths. The rand knife or welt knife, with the bead—made so as to cut a bead—was put on and used in the early part of the spring of 1878.

Int. 22. State whether or not with the sliding toothed sleeve locked at a proper distance from the rand-cutter this cutter will cut the edge of the sole, the bottom of the sole near the edge, and the rand in the same manner and to the same extent as would the cutter shown in the complainants' patent.

Ans. It would cut the rand and a bead, and cut on the bottom of the sole, and concave the edge, the same as the cutter shown in complainants' patent, if made with the same outline as this is (Thompson's cutter).

428 Int. 23. Please state whether or not, in your opinion based upon your experience and knowledge of the tools, there is any difference in the operation of the Exhibit Dunham Edge Cutter and the cutter shown in complainants' patent, except that one moves in a rotary path, whilst the other moves and operates by a reciprocating or back-and-forward motion.

Ans. I should say there was no difference.

Int. 24. Please state whether, in your opinion based upon your experience and use of the tools, there was any difference between the cutter shown in complainants' patent and the Exhibit Snell & Atherton cutter, except that the teeth in the latter constitute but part of a circle, while in the other they are arranged in an entire circle around a hollow hub and are inserted therein.

Ans. I should say there was no material difference, except there is no "sunken channel guard" on the Snell & Atherton cutter.

Int. 25. Please explain what you mean by a channel guard, by referring to complainants' patent, and state whether the same was well known before the date of filing the application for complainants' patent.

Ans. I mean by the "sunken channel guard" the smaller or inner ridge "2" in complainants' patent, which has been used commonly and well known for over ten years.

Adjourned.

BOSTON, *September* 1, 1882.

Direct examination resumed:

Int. 26. Please state whether you were familiar with any machine prior to the first introduction of edge-trimming machines by the complainant company which would trim both the rand and the sole edge at one and the same operation.

Ans. I was.

Int. 27. What machine was it that you was thus familiar with?

Ans. The Coté.

Int. 28. When did you first know of the use of those machines adapted to take out the rand and trim the sole edge at one operation, as you have stated?

429 Ans. In the summer and fall of 1874.

Int. 29. Where were they used at or about that time? Please state the places—that is, the names of the proprietors and the localities where you saw them used.

Ans. At C. F. Porter's, Charles R. Ford's, Porter & Southworth's, and Warren A. Howard's, all of North Bridgewater, now Brockton.

Int. 30. Have you heretofore known of the use of edge-trimming machines having combined rand and edge trimming cutters like those shown in "Defendants' Exhibits Busell Patents 1, 2, 3?"

Ans. I have.

Int. 31. When did you first know of their use?

Ans. The latter part of 1876 or 1877—I think in the spring of 1876.

Int. 32. Would or not the cutters of those machines remove the rand and trim the edge of the sole at the same time?

Ans. They would in a large portion of the styles of boots and shoes, but not in all cases.

Int. 33. How long did such machines continue in use, so far as you know?

Ans. Machines of that kind were sold by the complainant company up to 1879 or 1880, and are in use at the present time in some of the largest factories in the State.

Int. 34. What, in your judgment, was the efficiency of the machines made with cutters like the Exhibit Busell Patents, as compared with machines having the Orcutt cutter described in complainants' patent, in the matter of trimming both the rand and the sole edge at the same operation?

Ans. At that time of the first introduction of rotary trimmers it was hard work to get manufacturers to consent even to make a trial. If at that time the manufacturers were as well educated in the use of machine trimming as they are to-day, there is no doubt that they would have been glad to use cutters of this kind in complainants' patent to trim a uniform thickness. They were not willing to try anything but their cheapest work. The cutters then that would rand and trim at the same operation would give them a saving large enough on cheap work to induce them to try them. As they advanced in the use of the machine and saw that better
430 work could be trimmed, even with more expense, with this cutter—complainants' patent cutter—the rand or upper edge had to be removed by hand.

Int. 35. With two machines equally well made and with cutters equally well made, one having the Busell cutter and the other the Orcutt cutter, which, in your judgment, would be most effective in trimming both the rand and the sole edge at the same operation?

Ans. The Busell cutter.

Int. 36. What difficulties, if any, are experienced in trimming the sole edge and cutting out the entire rand at one operation with the Orcutt cutter?

Ans. The rand lip is of one height all the time, and the rand or upper edge is of different widths. If you should make the rand lip on the Orcutt cutter wide enough to reach in the full width that you find in some places on the upper edge in operating, as you come to a position where it was not so wide, the guard would strike the upper and keep the bed of the cutter away from the edge.

Int. 37. Please describe the operation of the cutter shown in the Exhibit Busell Patents and state wherein their operation differs from that of the Orcutt cutter.

Ans. The rand knife in the Busell cutter is attached to a flexible shaft; that gives the rand guard chance to ride on the upper and cut the rand at whatever width there is on the upper edge. With the Orcutt cutter you can cut only one width. There will be places where the lip wouldn't extend the full width of the upper edge or rand.

Int. 38. When did you first know of rotary edge-trimmers being made and used; by whom were they made, and where were they used?

Ans. I first knew in the summer of 1874. They were made by the Boston Shoe Machinery Company under the Coté patents. They were used in North Bridgewater, now Brockton.

Int. 39. Were or not those machines adapted to trim the edge of the sole and the bottom next to the edge?

Ans. They were not.

Int. 40. When did you first know of the use of machines adapted to trim the edge of the sole and the bottom adjacent to the edge?

Ans. In the winter of 1874 and 1875. Mr. Bolling attached
431 to a Coté trimmer at C. R. Ford's factory, in North Bridgewater, cutters that would cut on the bottom of the sole and leave the edge of a uniform thickness.

Int. 41. Please state whether the machines mentioned by you as made by Bolling were provided with cutters like or similar to that shown in his patent, number 192,616, dated July 3, 1877, now shown to you and marked Defendants' Exhibit Bolling Patent, E. H., sp'l ex'r.

(Counsel for defendants here puts the above-named patent in evidence.)

Ans. They were.

Int. 42. Where were these Bolling machines used and by whom?

Ans. The Excelsior trimmer, made under Bolling's patent, was used in C. E. Johnson's factory, at Natick, Mass.; Lucius Leach's, and C. R. Ford's, North Bridgewater.

Int. 43. When did you first know of machines having a rand-cutter upon one shaft and an edge-trimmer upon another shaft, as shown in your patent of January 4, 1881?

Ans. I made or caused to be made in the fall of 1877 a rand knife on a separate shaft and experimented at intervals up to July, 1880,

when I built a machine like the one represented in "Defendants' Exhibit Corthell Patent."

Int. 44. How extensively have such machines been introduced and used?

Ans. I have sold them all over the United States, the Canadas, and exported some to other foreign countries.

Int. 45. Please describe, as clearly as you can, the difference between the operation of machines thus constructed and machines having but one shaft, upon which are mounted both the rand-cutter and edge-trimmer.

Ans. In the machine where the rand-cutter and molded cutter are on one shaft the rand or a large portion thereof has to be removed by a hand tool. The machine with a molded cutter on one shaft and the rand-cutter on a separate shaft will remove all the rand or upper edge required, saving the hand process of "randing," and completing the job more perfectly.

Int. 46. On what classes of work is it necessary to remove the rand with a hand tool before presenting the shoe to the ro-
432 tary cutter where the machine is provided with but one shaft, as in the complainants' machine?

Ans. On all first-class work.

Int. 47. Please examine the thing now shown to you, marked "Defendants' Exhibit Rounds' Rand and Edge Cutter, E. H., sp'l ex'r," and state whether you have before seen the same or others like it; and, if so, when first and where.

Ans. I have. I saw them in the fall of 1874 at C. F. Porter's factory, at North Bridgewater.

Int. 48. Were they or not in use; and, if so, what was the efficiency of their operation?

Ans. They were in use in several factories; they would not take out the rand any more complete than the Orcutt cutter, but as well; they had to take out the main portion of the rand or upper edge by hand.

Int. 49. Do you know of any special reasons why the earlier edge trimming machines, about which you have testified, were not more generally introduced? If so, please state the same.

Ans. I know of no reason, except the trade wasn't ready and prepared to take hold of them. The trade wasn't educated up to using edge-trimming machines.

Int. 50. Were there or not any complications or threats of suits by reason of patents held by other parties; and, if so, who assumed to own or control such patents?

Ans. I think that was largely the trouble; it made a great deal of delay in introducing machines. The Excelsior trimmer was well started, giving good satisfaction; but by the threats of D. Whittemore, of Boston, the company was obliged to compromise and close up their business.

Int. 51. Who succeeded to the control of the patents held by Whittemore, if you know?

Ans. It is now called "The Busell Trimmer Company."

Int. 52. When did you first know or hear of cutters like Com-

plainants' Exhibit Defendants' Cutter or cutter shown in complainants' patent?

Ans. I first see a cutter made solid and freed back like Complainants' Exhibit Defendants' Cutter in the summer of 1878. The only difference it was smaller in diameter and only half as many teeth.

433 Int. 53. Who made or had this cutter just referred to as seen by you?

Ans. F. M. Stevens.

Int. 54. When did you first hear of cutters molded like or similar to the Exhibit Brown Patent Cutter, but adapted to trim the soles of boots and shoes?

Ans. I have just stated the first one I saw was in the summer of 1878. I had my attention called to Brown & Sharpe's milling tool in the spring of 1878 by Mr. Leavitt, foreman of D. Whittemore's factory. He suggested to me the making of a molded cutter I was getting up—to make it in that way—on the same principle as the Brown & Sharpe milling tool. Some of us suggested the same idea; in fact, all hands seemed to be interested in getting up a molded cutter for trimming shoe-sole edges.

(Noon recess.)

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 55. Do you think either one of these three exhibits—Dunham Edge Cutter, Snell & Atherton Edge Cutter, and Thompson Rand and Sole Edge Trimmer—is substantially the same as the thing described in complainants' patent? If so, please state which and why you think so.

Ans. I think they are all substantially the same, because they give substantially the same result, providing they all have the same outline.

Cross-int. 56. Were you ever employed by the Busell Trimmer Company in any capacity; if so, from what time to what time and in what capacity?

Ans. I don't know as I can say safely that I was ever employed by them. I think Mr. Whittemore let me to them for a fortnight or three weeks once. I sold a machine for them once for which they paid me a commission. I think it was in the fall of 1879 I sold the machine. I think it was in the summer of 1878 that I worked the fortnight or three weeks.

Cross-int. 57. Do you think that this article, Exhibit Rounds' Rand and Edge Cutter, is substantially the same as Exhibit Defendant's Cutter? If so, please state fully why you think so.

434 Ans. I do so far as it goes, but there is no channel-cutter on the Rounds. It will give the same results, except the channel guard, which the Rounds cutter has not got.

Cross-int. 58. Please answer the same question as to the tool shown in Exhibit Bolling Patent.

Ans. I do, because it trims a uniform thickness and gives the same result.

Cross-int. 59. In your opinion are all tools for trimming sole edges substantially the same which give the same results?

Ans. I could say they are to a certain extent.

Cross-int. 60. I will put the same questions, in substance, that you have already answered in different form, namely: What substantial differences, if any, do you think there are between Exhibits Dunham Edge Cutter and the thing described in complainants' patent? Please answer also the same question as to Exhibits Mann's Edge Cutter, Thompson's Rand and Sole Edge Trimmer, Rounds' Rand and Edge Cutter, Brown Patent Gear Cutter, Brown & Sharpe Milling Cutter 1, Brown & Sharpe Milling Cutter 2, Colt's Armory Cutter, the tool described in Exhibit Bolling Patent, the tools described in Exhibits Busell Patents 1, 2, and 3, Exhibit Defendants' Cutter, and Exhibit Complainants' Cutter; also the tool described in Exhibits Tayman Patent and Tayman Reissue.

Ans. There is no substantial difference in any of them, providing the cutting outline—the outline that cuts—is the same.

Cross-int. 61. Do you think that Exhibits Dunham Edge Cutter and Defendants' Cutter are each equally well adapted for use in a rotary edge-trimmer? If not, please explain fully why not, in your opinion.

Ans. The form and outline of the Dunham edge-cutter is all right for a rotary cutter, and the knife or cutter, if set into a hub with others, *it* would give the same result.

Cross-int. 62. Do you mean removing the molded guard of Exhibit Dunham Edge Cutter or do you mean simply putting a number of Dunham edge-cutters in one hub, having a guard for each blade?

Ans. I meant putting the cutter part in a hub without the guard.

Cross-int. 63. Do you think there is anything whatever in the thing described in Exhibit Complainants' Patent which is
435 substantially the same as the molded guard in Exhibit Dunham Edge Cutter; if so, what is it?

Ans. I do. It is the back part of each tooth that guards the other, substantially the same as the guards of the Dunham edge-cutter.

Cross-int. 64. Then your answer to Int. 62 is wrong, isn't it?

Ans. I don't understand that it is.

Cross-int. 65. Then you must mean, I suppose, that some part of the Dunham blade acts as a guard in the Exhibit Dunham Edge Cutter?

Ans. I do.

Cross-int. 66. It don't, as a matter of fact, do anything of the kind in that exhibit as it is used practically, does it?

Ans. I should say it did.

Cross-int. 67. Then you think there are two guards in Exhibit Dunham Edge Cutter with the cutting edge between them?

Ans. I certainly do.

Cross-int. 68. And what do you think is in Exhibit Dunham Edge Cutter substantially the same as the hub in Exhibit Complainants' Cutter?

Ans. The handle that holds the cutter to a certain extent.

Cross-int. 69. And what is there in Exhibit Dunham Edge Cutter which you think is substantially the same as the hole through and the axis of Exhibit Complainants' Cutter?

Ans. This tool is used by hand, and of course don't need any hole or any axis.

Cross-int. 70. And why is it that you are unable to see that what you have said as to the differences between the Exhibit Dunham Edge Cutter and complainants' cutter demonstrates that they are substantially different things?

(Objected to as unintelligible, metaphysical, and involves a mere question of mental self-vision.)

Ans. I see no difference, as they all give the same result when they have the same cutting outline.

Cross-int. 71. You agree with me, do you not, that there is a molded guard in Exhibit Dunham Edge Cutter that has no cutting edge, and that there is no such guard in Exhibit Complainants' Cutter?

436 (Objected to as having been answered in interrogatory 63.)

Ans. The guard in the Dunham cutter may not have a cutting edge. I believe there is a guard in the complainants' patent cutter which is substantially the same as that in the Dunham.

Cross-int. 72. You no doubt meant to answer my question, but you haven't done so; please answer it.

Ans. There is no cutting intended to cut as you use this tool (Exhibit Dunham Edge Cutter); but if this same guard was revolved it would cut. I shall say that there is a guard like that in complainants' cutter, substantially the same.

Cross-int. 73. Then, if I understand you, you think that the molded guard in Exhibit Dunham Edge Cutter is substantially the same as any one of the blades in Exhibit Complainants' Cutter, and also substantially the same as the blade in Exhibit Dunham Edge Cutter. Is this the way you mean to be understood?

Ans. I think the guards are all substantially the same, only I don't think this guard in the Dunham plane, as used by hand, is intended to cut.

Cross-int. 74. Do you think the blade in the Dunham edge cutter is substantially the same thing as any one of the blades in the complainants' cutter?

Ans. I do.

Cross-int. 75. Do you think that the guard in the Dunham edge-cutter is substantially the same thing as any one of the blades in complainants' cutter?

Ans. I do, when used as a rotary cutter.

Cross-int. 76. What is the meaning of these letters and figures, "M. No. 20, M. C. 1½ L.," on Exhibit Complainants' Cutter, and "No. 16, M. C. R. L.," on Exhibit Defendants' Cutter?

Ans. This "M." before the number I don't know anything about; "No. 20" is the size, in width, of the bed; "M. C." is medium con-

vex; "1½" is the height of the lip, and "L." is the lip, complainants' cutter. Defendants' cutter: "No. 16" means the width of the bed; "M. C." medium convex; "R. L." rand lip.

Cross-int. 77. How long have you used that mark "R. L." meaning rand lip, on your cutters?

Ans. I don't know as I could tell exactly; probably a year and a half—somewhere thereabouts.

437 Cross-int. 78. Do you know what part of an inch "1½" represents?

Ans. On our cutters I believe there is $\frac{1}{32}$ of an inch to a size. According to that, "1½" would be $\frac{1}{32}$ and $\frac{1}{2}$ of $\frac{1}{32}$.

Cross-int. 79. What would be the number of the rand lip on Exhibit Defendants' Cutter, using numbers in this way?

Ans. We make all one and a half unless otherwise ordered.

Cross-int. 80. Please state the names commonly applied to the different portions of the cutting edge of these two cutters, Exhibit Complainants' Cutter and Defendants' Cutter.

Ans. I will state what we commonly call them: We call this lip on the outer edge the "rand lip;" the smaller ridge next to it we call the "bead;" the convex part we call the "bed;" this next ridge on this cutter (defendants' cutter) we call the "plain channel guard;" the extra ridge in the channel guard of the complainants' cutter we call, when in our cutters, the "sunken channel." It has the name of "French channel" with hand-kit makers.

Cross-int. 81. As I understand it, defendants' cutter would be said to have a "plain channel guard" and complainants' cutter to have a "sunken channel guard." Is that the right use of these terms?

Ans. That is what we call them.

Cross-int. 82. One of your witnesses seemed to think that the hand welt knife or some other independent welt knife was used in all cases where shoes were trimmed with rotary cutters, such as are made by complainants and defendants. You know that many thousand pairs are trimmed daily without the use of any hand welt knife or any other welt knife except the rand lip on a rotary cutter, do you not?

Ans. I know there is a class of work that it, the lip on the cutter, answers the same purpose as to take it out by hand. I also know that there is a good many pairs of boots and shoes in that day's work that have to be relieved with a hand tool before they can present the edge to the cutter.

Cross-int. 83. These rotary cutters—Exhibits Defendants' Cutter and Complainants' Cutter—are never used without a rand guide or guard, which is a circular disk placed close up against that side of the cutter on which is the rand lip. Is this so?

Ans. It is so.

438 Cross-int. 84. The boot or shoe would be ruined, wouldn't it, no matter how careful the operator was, if he tried to use these cutters without a rand guide or guard?

Ans. That would depend greatly upon the style of edge—whether it was a full edge or a close edge.

Cross-int. 85. Did you ever know a rand guide or guard to be used

with either of these three tools—Exhibits Dunham Edge Trimmer, Snell & Atherton Cutter, Mann's Edge Cutter?

Ans. The equivalent to the guard on the rotary cutter is found in the beveling on the outer side of the lip of these three exhibits. These tools being used with a very slow motion, the beveling answers the same purpose as the disk in the rotary cutter.

(Adjourned.)

BOSTON, *September* 4, 1882.

Direct examination resumed:

Int. 86. Please examine your answers to cross-interrogatories 65, 66, and 67 and state whether or not in the practical use of the Dunham edge-cutter by varying the position of the handle and consequently the relative positions of the face of the cutter and of the sole edge the removable piece or guard in front of the edge-cutter would serve at times as the guard or gauge, while at other times the outer or peripheral surface back of the cutting edge would serve as the gauge or guard in the same manner as each tooth in both complainants' and defendants' cutters serves as the guard for the succeeding tooth.

(Objected to as leading.)

Ans. They would so operate.

Int. 87. Please state what constitutes the guard or gauge to determine the depth of cut in both Complainants' and Defendants' Exhibits Rotary Edge Cutters.

Ans. Each tooth is a guard for the following tooth, and the width of space between the teeth and the clearance on the top of the tooth assists in determining the depth of the cut.

Int. 88. How differently, if at all, is the depth of cut determined when using the Exhibit Snell & Atherton Cutter than when using the complainants' or defendants' rotary cutters?

439 Ans. There is no difference; both are the same.

Int. 89. You have been inquired of in relation to the meaning of certain marks and figures on Exhibits Complainants' Cutter and Defendants' Cutter. Please state whether the letters thereon indicate new or old and well-known names of parts of the cutter to which they refer.

Ans. The names are old and well known, and the parts have been called by those names, to my knowledge, for the past twenty years. Shoemakers in ordering or in speaking of different ridges or parts on hand planes and cutters have different terms for each part.

Int. 90. Please state whether or not cutters like Exhibits Dumham Edge Cutter and Snell & Atherton Cutter were made in varying or graduated sizes. If so, how long have they been so made?

Ans. They were and are, and have been, to my knowledge, the past twenty years.

Int. 91. Please state the method, order, or system of such graduation.

Ans. The graduation of the bed on a number 12 cutter would be $\frac{13}{48}$ from the lower corner of the bead to the lower corner of the channel guard. The size of the bead varies according to the width of the bed in most cases. The lip is measured from the bed to the top, including the bead, and is graduated by some makers by 48ths of an inch and by others by 32nds of an inch; and the same is true of the beds. Some makers measure the lip from the top of the bead and graduate it in the same way. The guard that cuts on the bottom of the sole edge when having a sunken or, as sometimes called, a "double channel guard" is measured or graded by 48ths and 32nds.

Int. 92. Please state, if you know, whether edge-finishing tools like Exhibits Dunham Edge Cutter and Snell & Atherton Cutter have been made use of in obtaining various styles, sizes, and forms of rotary cutters like those which are made by both the defendant and complainant companies.

Ans. They have.

Int. 93. Please state how this is done and your means of knowing the same.

Ans. As a general thing when selling an edge-trimmer to manufacturers the first thing is to find out just what styles and
440 sizes of cutters he requires, and in most cases the outline or form is got by planing small pieces of leather or wood with the styles of planes that he uses in his factory, and then we make cutters to duplicate the same outline. All machines that are sold at any great distance they send these pieces to me, and in a great many cases they send us the hand plane that they are using to go by.

Int. 94. In cross-interrogatory 80 you are inquired of as to the names of the several parts or members of the two cutters Exhibits Complainants' Cutter and Defendants' Cutter. Please examine the Exhibits Dunham Edge Cutter and Snell & Atherton Edge Cutter and state whether you find therein what is known and called a "rand lip," like or similar to that shown in said first-named exhibits.

Ans. I do find the same.

Int. 95. Please state in the same connection whether you find a small ridge called the "bead."

Ans. I do.

Int. 96. Please state in the same connection whether you find the part called the "bed."

Ans. I do.

Int. 96½. Please state in the same connection whether you find the part called the "channel guard."

Ans. I do; such as is called the "plain channel."

Int. 97. Please state whether the small angle on the channel which you have termed a "sunk" or "French" channel has been commonly used heretofore in edge-finishing tools; and, if so, how long have you known of its use.

Ans. It has been commonly used, more or less, for the past fifteen years to my certain knowledge.

Int. 98. Please examine Complainants' Exhibit Tayman Patent, dated March 11, 1873; Defendants' Exhibits Bolling Patent, dated July 3, 1877; Busell Patent 1, dated March 13, 1877; Busell Patent 2, dated May 21, 1878, and letters patent No. 157,476, issued to James C. Knights Dec. 8, 1874 (now put in evidence and marked "Defendants' Exhibit Knights' Patent, E. H., sp'l ex'r"), and state whether you find in any of said patents a rand guide or guard; and, if so, state in which of the exhibits you find the same.

Ans. I find a rand guide or guard in the whole of them
441 and revolving in all except said Busell patent No. 2, in which patent it is stationary.

Recross-examination:

Cross-int. 99. Do you know of any tool for trimming the edges of boot and shoe soles which you do not believe to be substantially the same as the tool described and claimed in the complainants' patent?

Ans. I do.

Cross-int. 100. Please describe it.

Ans. It was a common knife, ground on both sides, with a rand guide to prevent the end from cutting the upper.

Cross-int. 101. Do you know of any other tool for trimming sole edges which you do not believe to be substantially the same as the tool described and claimed in the complainants' patent?

Ans. I don't.

Cross-int. 102. Did you ever see this tool, Exhibit Thompson Rand and Sole Edge Trimmer, in use? If so, what prevented the cutter, in the form of the sliding collar, from taking too much off from the bottom of the sole?

Ans. I have seen it in use. The cutting edges didn't have so much clearance, and it had a very light spring; this is a heavy spring.

Cross-int. 103. Was that tool, the Thompson rand and sole-edge trimmer, ever used practically in the manufacture of boots and shoes, to your knowledge?

Ans. It was to a certain extent, but the sleeve was set rigid so it would not slide. Then it was used with a plain rand knife in the end, with the sleeve yielding, with the stop set for certain thicknesses; and the result of it was to cut a uniform thickness on the fore part of the edge, in front of the shank, and the sleeve would ride against the bottom of the shank and take the feather off. At that time it was thought a great deal of.

Cross-int. 104. What turned out to be the practical objections to that tool, that you know of?

Ans. On or about that time David Whittemore and the complainant company joined hands and stopped the sale of the machines and introduced their own.

Cross-int. 105. Do you know of any practical disadvantages in that tool, whether in relation to the manufacture or use?

442 Ans. It wasn't so good for all classes of work as some other tools.

Cross-int. 106. Don't you see that its construction is wholly different from that of these two tools, Exhibits Complainants' Cutter and Defendants' Cutter?

Ans. Of course; there is more pieces to it.

Cross-int. 107. And yet that tool, Thompson rand and sole-edge trimmer, has a rotary channel guard and a rotary bed and rotary rand knife and a rotary rand guide, hasn't it?

Ans. Yes, sir.

Cross-int. 108. On reconsidering this matter don't it strike you as absurd to say that this tool, Exhibit Thompson Rand and Sole Edge Trimmer, is substantially the same thing as the rotary cutter for trimming sole edges described in complainants' patent?

Ans. I think it is substantially the same thing.

Cross-int. 109. What are the practical advantages and disadvantages of these two tools, Exhibits Mann's Edge Cutter and Snell & Atherton Cutter, as compared with those of the rotary cutter for trimming sole edges, described in the complainants' patent, including questions of construction and mode of operation, as well as desirability of the edge produced?

Ans. You can trim just as good an edge with one as you can with the other. The advantages over these hand tools of the rotary cutter in a trimming machine is it will accomplish more work.

Cross-int. 110. You haven't considered in your answer the matter of construction. Please do so.

Ans. I don't see as there is any advantages in that respect.

Cross-int. 111. You are aware, I suppose, that the rotary cutters can be shaped by turning, and that the hand tools referred to cannot?

Ans. I am aware that the hand tools of this description do have molded forms cut on them by being placed in a rotary hub and locked and revolved in a lathe. What I mean to be understood is that they do place one or more in a hub and mold them any desired form they wish.

Cross-int. 112. You don't think, do you, that they ever shape the sides and ends and shanks of the metal part of these hand tools by revolving the tool on centers and holding up a cutter against it?

Ans. If I understand this question they don't form these sides and ends and shanks in a lathe.

443 Cross-int. 113. And what parts in the rotary cutter for trimming sole edges, described in complainants' patent, do you think are substantially the same as the triangular tooth on one side and the large, short tooth on the other side and the shank of Exhibit Snell & Atherton Cutter.

Ans. Every tooth in the complainants' cutter is substantially the same as the triangular tooth and the short tooth in the back. There is no shank required in the rotary cutter. When I speak of this cutter—Snell & Atherton cutter—as being substantially the same as complainants', I mean that part of the tool that cuts is substantially the same.

Cross-int. 114. Then you don't think, do you, that these two tools—

Exhibits Snell & Atherton Cutter and Mann's Edge Cutter—are the same thing substantially as the rotary cutter for trimming sole edges described in complainants' patent?

Ans. Yes; I do think they are substantially the same.

Cross-int. 115. I suppose you agree with me that this tool—Brown patent gear-cutter—has neither the rand lip, the bead, the bed, or channel guard. Am I right?

(Objected to, as the question embraces an element, to wit, the bead, which constitutes no essential part of the patent in controversy.)

Ans. I don't see any in this cutter, Brown patent gear-cutter.

Cross-int. 116. Please answer the same question as to Exhibits Brown and Sharpe Milling Cutter 1 and 2 and Colt's Armory Cutter.

Ans. Brown & Sharpe milling-cutter No. 2 has a concaved bed; Brown & Sharpe milling-cutter No. 1 has a flat bed on one edge; Colt's armory cutter has a concave bed, a lip, and channel guard.

Cross-int. 117. Why are the teeth which you have just called a lip, in Colt's armory cutter, backed off on the sides, instead of being flat on the sides, as in Exhibits Complainants' and Defendants' Cutters?

Ans. I think likely it was intended to cut; if it wasn't, they probably wouldn't have backed it off that way.

Cross-int. 118. Do you believe that that cutter, Exhibit Colt's Armory Cutter, was intended for trimming sole edges?

Ans. I don't think it was.

Cross-int. 119. Can you tell from inspection of that exhibit—
444 Colt's armory cutter—just what shape it would mill or just what the outline of the cutting edge of each tooth is?

Ans. The top surface would cut a round bead; the flat, square bed on one side of it, and what I would call a lip, would cut a deep, narrow groove. That is what the cutter was probably intended to do, but with a rand guide or disk on the side the lip is on it would cut one of the well-known styles of shoe edges.

Cross-int. 120. And what style do you think that is—how is it called?

Ans. It would cut a light, full, round edge.

SAMUEL N. CORTHELL.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Frank M. Stevens.

BOSTON, *August* 28, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Please state your name, age, residence, and occupation.

Ans. Frank M. Stevens; age, 35; Boston; machinist.

Int. 2. Are you familiar with the manufacture of rotary cutters; and, if so, how long have you been familiar with the same? And state what experience you have had therewith, if any.

Ans. I am, and have been about six years. My experience first was on a molded cutter, in August, 1878. I made a rotary cutter as an experiment at that time. I made one some time after that, several months, my second one, and, finally, I made a third one shortly after that; since then I have been making cutters all the time.

Int. 3. For whom are you now making such cutters?

Ans. The Corthell Manufacturing Company.

Int. 4. Please examine the cutter now shown you, marked "Complainants' Exhibit Defendants' Cutter," and state when you first saw a cutter like it, who made it, and for whom it was made.

445 Ans. The first cutter that I ever saw like that was in August, 1878. I made it for Samuel N. Corthell.

Int. 5. Did you ever at any time make any cutters for trimming shoe-sole edges which were for or intended for O. L. Noble? And, if so, please state when and where you made the same.

Ans. I made cutters for O. S. Noble in the fall of 1878 or winter; about that. I made a rotary cutter for him for trimming the edges of shoes.

Int. 6. Please examine the patent granted to W. D. Orcutt March 1, 1881, and marked "Complainants' Exhibit Complainants' Patent," and state the use or object of the ridge "1" on the cutter therein shown, the ridge "2," and the edge "c."

Ans. The object of ridge "1" is for taking out the rand, ridge "2" is for taking the channel off the shoe bottom, "c" is for concaving the bed of the edge; the other ridge 2 is for continuing that bevel.

Int. 7. Please state wherein, if at all, the cutter made by you for O. L. Noble, as stated by you, differed from the cutter shown in the complainants' patent.

Ans. There is no difference in the cutter, I will say, except there might be more or less blades inserted.

Int. 8. Were you at the time you made the cutter for Noble in business for yourself; and, if not, in whose employ were you?

Ans. I wasn't in business for myself, but in the employ of David Whittemore.

Int. 9. Did you make any other cutter which was intended for Mr. Noble; and, if so, how did it differ, if at all, from the first cutter you made for him?

Ans. The second cutter I made for him, there was no difference, except in the number of blades inserted.

Int. 10. When did you make the second cutter for Noble, as just stated by you? State as nearly as you can.

Ans. It was in the fall of 1878.

Int. 11. Are you familiar with the cutter shown and described in United States patent No. 207,395, granted to Samuel N. Corthell Aug. 27, 1878, and do you know who first constructed such cutters?

446 (Patent now put in evidence and marked "Defendants' Exhibit Corthell Patent, 1878, E. H., sp'l ex'r.")

Ans. I am familiar with this cutter—Samuel N. Corthell's. I am the first one that made this cutter for Samuel N. Corthell.

Int. 12. Did you have any conversation with O. L. Noble at or about the time you made the first cutter for him, as stated, in relation to the Corthell cutter or any changes in the same; and, if so, what was the subject of the conversation, and what did it result in, if anything?

Ans. I had a conversation with O. L. Noble in regard to the Corthell cutter. I made some suggestion of turning the blade the other side up—the molded surface up. The result was that I made the cutter as suggested.

Int. 13. What was the cutter that you made in accordance with the suggestions, as just stated by you? Please describe it, and also describe as definitely as you can the method of its construction.

Ans. It was a molded surface cutter corresponding with figures "1," "2," and letter "*c*" of Orcutt's patent (complainants' patent). It was an inserted blade, the blade molded on its surface, and then set in on a different angle to give it clearance.

Int. 14. Do you or not know whether O. L. Noble had a cutter like the Orcutt cutter made by some person besides yourself between the times when you made the first and second cutters for him, as stated? And, if so, please state how you know the same.

Ans. There was one cutter made between the times by somebody not familiar to me—about the time between the times I made the two; made, I suppose, by somebody on Charlestown street, number 36. I know it by a cutter brought in and shown to me by Mr. Noble. The conversation was whether we should put in more or less blades.

Int. 15. Do you know whether said Noble, at the time you made the first and second cutters for him, was acting as the agent of the Busell Trimmer Co.? And, if so, please state.

Ans. He was acting as agent of the Busell Trimmer Company.

Int. 16. After you made the first cutter for Noble, as stated by you, did you have any conversation with him in relation to the operation of the cutter, whether it was satisfactory or not; and, if so, what did he say?

447 Ans. He said the cutter—he hadn't given it a thorough trial, but it worked very beautiful.

Int. 17. After you had made the two cutters for Noble, as you have stated, where did he procure similar cutter for use, and did you have any conversation with him in relation to such subsequent cutters? And, if so, state its substance.

Ans. The next cutters that I saw of that description came from Brown & Sharpe's; the conversation on the cutter was why they were made at Brown & Sharpe's. The answer to that was because they held the patents on the method of backing off the cutters.

Int. 18. Who made the answer in relation to the backing off of the cutters, as stated in your last answer? And state, as nearly as you can, the date of the same.

Ans. Mr. Noble; it was along in the spring, I think, of 1879.

Int. 19. Please state, as nearly as you can, the date when you made the first cutter for Mr. Noble, as heretofore stated by you.

Ans. The first cutter was made in October or November of 1878.

Int. 20. Please examine the thing now shown to you, marked "Defendants' Exhibit Thompson Rand and Sole Edge Trimmer, E. H., sp'l ex'r," and state whether you have seen the same or others like it; and, if so, when first, as nearly as you can, and where.

Ans. When I first saw this sole edge and rand trimmer it was in the spring of 1878, at David Whittemore's factory, at Wollaston.

Int. 21. What was being done, if anything, with the cutter you so first saw?

Ans. It was being constructed.

Int. 22. By whom and for whom?

Ans. By myself, for either Corthell or Thompson; I couldn't say which.

Int. 23. What is the object or use of the cutter inserted in the thick disk at the outer end of the exhibit?

Ans. It is for trimming out the rand and moulding the bead on the edge.

Int. 24. What is the object of the sliding collar having the toothed end or face?

Ans. For trimming the surface on the bottom of the sole of the shoe.

448 Int. 25. Do you know whether, at or about the time you first saw such cutters, similar ones were made and adapted to adjust and lock the toothed sliding collar at any desired distance from the rand-cutters, as the thickness of sole might require?

Ans. Yes; I do know that they were so made.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 26. When did you leave the employ of David Whittemore?

Ans. In the spring of 1880.

Cross-int. 27. When did you commence work for the Corthell Manufacturing Company?

Ans. In May, 1880.

Cross-int. 28. Please refer to your twelfth answer and state whether the cutter there referred to as made by you was the first cutter made by you for Mr. Noble, referred to in your fifth answer.

Ans. I believe it was the first cutter.

Cross-int. 29. Do you recollect making one or more cutters for Mr. Noble after Exhibit Corthell Patent, 1878?

Ans. I do.

Cross-int. 30. How many do you recollect making for him?

Ans. Two.

Cross-int. 31. And when was the first Corthell cutter made by you for him, according to your present recollection?

Ans. It was in the fall of 1878.

Cross-int. 32. Do you recollect whether it was before or after you

made the first one referred to in your fifth answer, or are the cutters referred to in your fifth answer these two Corthell cutters?

(Objected to as being neither logical or intelligible.)

Ans. I made those cutters—the Corthell cutters—before I made the two referred to in the 5th answer.

Redirect:

Int. 33. Do you or not remember of making, some time in the summer of 1878, cutters like the Exhibit Corthell Cutter, with a rand knife or cutter inserted in the end, so as to take out the rand?

442 Ans. I do remember making them.

Recross:

Cross-int. 34. Do you think that this cutter, Exhibit Thompson Rand & Sole Edge Trimmer, is substantially like the cutter described in complainants' patent when the sliding toothed collar is fixed in position?

Ans. I do.

FRANK M. STEVENS.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Jacob B. Mann.

BOSTON, *Aug.* 31, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Jacob B. Mann; 65; Brockton; shoe-tool maker.

Int. 2. How long have you been engaged in the manufacture of shoe tools, and at what place or places?

Ans. Well, forty-three years and a little more. First in North Bridgewater, then in Stoughton, next in East Bridgewater, and last in Brockton.

Int. 3. Please examine the tool now shown you and state whether — have heretofore seen the same or tools like it; and, if so, when first, by whom they were made, if you know, and for what purpose they are used.

Ans. I have seen them before; I should say prior to 1875. I made the first one I ever saw. It is used to round the cork sole. This part of my answer has reference to the half-round formed directly with the shank.

(Counsel for defendants here puts in evidence the tool shown the witness and marked "Defendants' Exhibit Mann's Edge Cutter.")

Int. 4. Were or not these exhibit cutters made by others besides yourself; and, if so, by whom, and were they or not used by boot and shoe manufacturers for trimming sole edges?

450 Ans. I think they were made by others and used by others; made by Snell & Atherton. They were used by boot and shoe manufacturers for trimming sole edges.

Int. 5. To what extent were these cutters made, sold, and used? Please state as nearly as you can.

Ans. I don't think they were extensively used, but were used for several years.

Int. 6. How many in number do you think you made and sold, as near as you can judge? And state, if you can form any opinion, the number which you think others made and sold, or whether they made and sold more or less than you did.

Ans. Perhaps from one to three hundred. I think others made a good many more.

Int. 7. How was the first tool spoken of by you as being made for trimming cork soles formed; did it have the teeth in three sections or parts, like the exhibit, or how was it formed?

Ans. It was one solid piece; part of a segment.

Int. 8. When were these tools first formed with teeth in three sections, like the exhibit?

Ans. Well, I think about the time of the other.

Int. 9. Did you give clearance or freeing to the outer rows of teeth in the cutters made by you; if so, how did you produce such clearance?

Ans. I did. It was produced by heating and bending back the teeth.

Int. 10. Please examine the tool now shown you, marked "Defendants' Exhibit Snell & Atherton Cutter," and state whether you are familiar with the same; if so, how long you have known such cutters and by whom they were made.

Ans. I am. I should think thirty years. I think by Snell and Atherton.

Int. 11. How extensively were these cutters made and used and for what purpose? Please state as fully as you can.

Ans. Well, I shouldn't say they came into use all over the country. They were considerably used in this State and may have been used outside—I am unable to say to what extent—for trimming the edges of boots and shoes—the soles.

451 Int. 12. Were they or not in general use in this State, and, in your judgment, based upon your knowledge, did the manufacture and sale of them extend to hundreds and thousands; and, if so, how many thousands should you say would be a safe and reasonable estimate?

Ans. I can only speak of my locality. They were used considerably there and in the neighboring towns. I think certainly hundreds. I don't know how many thousands. They extended to hundreds, I have no doubt.

Int. 13. Please state whether or not this Exhibit Snell & Atherton Cutter is formed and adapted to trim or cut the rand between the sole and upper, the edge of the sole, and the bottom of the sole near the edge.

Ans. It is adapted to making the entire edge of various devices;

I might say various styles, perhaps. I will say that of course this cannot be adapted to the various styles, but this kind of tool may.

Int. 14. Please examine the teeth in the exhibit and state whether, in your judgment, they are provided with clearance, and state how that clearance was produced.

Ans. I think the forward teeth are provided with clearance, and it is produced by bending the teeth back.

Int. 15. Please examine the exhibit now shown you, marked "Dunham Edge Cutter Exhibit, E. H., N. P.," and (re-marked) "Defendants' Exhibit Dunham Edge Cutter," and state whether you are familiar with the same or similar cutters; and, if so, for how long a time have you known them?

Ans. Well, I am familiar with this thing—these cutters—and have known them for twenty-five or thirty years.

(Counsel for defendants here puts in evidence Patent Office copy of drawing of letters patent number 15176, issued to I. A. Dunham June 24, 1856, for shoe-edge plane, and marked "Defendants' Exhibit Dunham's Patent Drawing, E. H., sp'l ex'r.")

Int. 16. Please state, if you know, as nearly as you can the extent to which the Dunham edge-cutter was made, sold, and used.

Ans. Well, I should say it was extensively used throughout the United States and probably in foreign countries.

Int. 17. By whom and where was it made?

452 Ans. By Snell and Atherton, at North Bridgewater, now Brockton.

Int. 18. Please state whether or not this cutter is adapted to trim the rand or welt between the sole and upper, the edge of the sole, and the bottom of the sole near the edge so as to bring it to a uniform thickness.

Ans. It is or can be made so by making the shape to correspond to the edge desired.

Int. 19. Is not the cutter now shown you adapted to trim the rand, the edge of the sole, and the bottom of the sole, as inquired in the preceding interrogatory, and to impart thereto its own exact shape; and is not this cutter adapted to be formed to trim all desired styles of edges and thicknesses of soles?

Ans. It is (in answer to the first clause of the question). It is (in answer to the last clause of the question), giving very nearly its own shape, of course.

Int. 20. Please examine the rotary cutter now shown you, marked "Complainants' Exhibit Defendants' Cutter," and compare the same with the Exhibits Dunham Edge Cutter and Snell and Atherton Cutter, and state what points of resemblance, if any, you find between them and wherein they differ.

Ans. The cutting I perceive to be on the same principle precisely. The difference would be that one is a section of a circle and the other is a complete circle. That is all the difference I can see.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 21. The clearance or freeing of the teeth in the middle section is obtained just as it is in saw teeth or the like, isn't it? I refer to Exhibit Mann's Edge Cutter.

Ans. Precisely.

Cross-int. 22. That row of teeth on the main part of the tool, Exhibit Mann's Edge Cutter, has no clearance or freeing except at one side—the side next the middle section, as it seems to me. Am I right?

Ans. I think it has. I think you are wrong.

Cross-int. 23. Do you perceive a clearance on the sides of that row of teeth on the main part of the tool, Exhibit Mann's
453 Edge Cutter, next to the middle section? And, if so, state how that clearance was obtained.

Ans. I think I do, and I think it was bent back. If this went up perfectly square (pointing to the tool) it would give no clearance on the sides by bending back; but its being beveled, it gives it a clearance by throwing it back.

(Witness points to the edges of the teeth which are formed on the main part of the tool.)

Cross-int. 24. Then the same clearance must also exist on the outer side of that row of teeth, on the main part of the tool, mustn't it?

Ans. I think not. It diminishes as it approaches a perpendicular.

Cross-int. 25. Please state to what styles of soles this exhibit, Mann's Edge Cutter, is adapted.

Ans. To cork sole edges.

Cross-int. 26. And how do you sharpen it when it gets dull?

Ans. By filing on the under side of the teeth with a thin file.

Cross-int. 27. Is there any clearance in the row of teeth on the outer section?

Ans. I think not.

Cross-int. 28. Do all three of the rows of teeth cut at the same time in the practical use of this tool—Mann's edge-cutter?

Ans. They must necessarily to get a perfect edge.

Cross-int. 29. And how many teeth in each row do the bulk of the work, or does that depend altogether upon how the operator holds the tool?

Ans. Entirely. He may lean it forward or hold it back. All the teeth may be brought into use, but not at the same time.

Cross-int. 30. By filing on the under side of the teeth, as described in your twenty-sixth answer, you mean filing on what I should call the top of the teeth when the handle is held down and the metal part up, don't you? Or do you mean filing on one of the flat faces of the row of teeth on the main part of the tool or that row on the outer section?

Ans. I do not (in answer to first part of the question). I mean

a flat file, filing between those teeth on the main part of the tool. The row on the outer section—the guard, properly speaking—is sharpened in the same way.

454 Cross-int. 31. In using this tool—Mann's edge-cutter—that row of teeth on the main part was nearest the upper of the shoe, and that row on the outer section nearest the bottom of the sole, wasn't it?

Ans. It was.

Cross-int. 32. Please describe how you sharpen the inner section of Mann's edge-cutter.

Ans. It is in three sections. We take it and sharpen it with a flat file on top.

Cross-int. 33. Are there three, four, or five cutting teeth in Exhibit Snell & Atherton Cutter, in your opinion?

Ans. There appears to be four here. I have made them of various numbers. There may be any number.

Cross-int. 34. In making tools of this kind—Exhibit Snell & Atherton Cutter—how did you get the curve on the metal and how did you then mold the molded edge, or were the curve and molded edge made at the same time and before the slots were cut between the teeth?

Ans. This edge is made and molded before the teeth are cut. The usual method is with cutters, and this (referring to the tool blank) swings on a center.

Cross-int. 35. And after the edge is made and molded the slots are cut or milled and the teeth are bent back and a little sideways to give the clearance to three of the teeth, but the large tooth at one end of the row is not bent or moved in any way, and neither is the triangular tooth at the other end of the row. Is this right, particularly as to the bending the teeth sideways when they are bent back?

Ans. I never knew them to be bent sideways. I never bent them sideways. I don't notice that there are but two or three bent. I should say two or three are bent back. I don't know whether the back tooth is bent back or not. I don't see any reason why it should not be, as it forms a part of the cutter. I never bend the forward tooth, as that is the guard.

Cross-int. 36. It seemed to me that it was practically impossible to bend back either of the three intermediate teeth without also bending them sideways, and also that it was practically impossible to bend back the outer cutting teeth at all without injuring the tool. Please reconsider this matter and state whether you still think I am wrong.

455 Ans. I still think you are wrong. This is heated when it is bent, and is quite soft, and requires to be bent but little. I fail to see how it could bend sideways.

Cross-int. 37. I now see that we don't mean the same thing by bending sideways. What I meant to say was that the extreme outer end of the tooth would bend back more on the side where the slot is longest; and it seems to me clear, from inspection of the tool, that that has in fact taken place. With this explanation of what I

meant by bending sideways, please state whether you agree with me or not.

Ans. I agree with you. It is bent more there, at the point that extends farthest out, than it is an eighth of an inch below, because the extreme point moves the farthest.

Cross-int. 38. I don't think I have made my question plain to you yet. Please describe how the operation of bending back the teeth is performed.

Ans. We use an instrument that will just fill the slot, heat the cutter, and bend back with the instrument that fills the slot.

Cross-int. 39. Do you think that there is no substantial difference between these two cutters, Exhibit Defendants' Cutter and Mann's Edge Cutter?

Ans. I think there is none. I think they are one and the same thing in principle.

Cross-int. 40. Please answer the same question as to these Exhibits Defendants' Cutter and Snell & Atherton Cutter.

Ans. I see none.

Cross-int. 41. Please answer the same question as to these two cutters, Exhibit Defendants' Cutter and Thompson Rand and Sole Edge Trimmer.

Ans. I do. This one (Thompson's) is relieved on the edge, and is also relieved by having the chip pass out here (pointing to the tool, the rand guide). The seat of this (Thompson's), the edge-trimming, cuts the same as that (the Exhibit Defendants' Cutter).

Cross-int. 42. Please answer the same question as to these two exhibits, the Brown Patent Gear Cutter and Defendants' Cutter.

Ans. I don't see any. The principle is all the same. There is no clear on the side of either of them, except by making the guard bevelled.

456 Cross-int. 43. Please explain what the guard is on the Brown patent gear-cutter.

Ans. It has no guard.

(Noon recess.)

Direct examination resumed:

Int. 44. Please state whether or not it was usual to form edge-cutters like Exhibits Mann's Edge Cutter, Snell & Atherton's Cutter, and the Dunham Edge Cutter to trim all varieties of styles of edges and all the various thicknesses of soles.

Ans. It was.

Int. 45. Would it not be practical for any good workman, skilled in making either of these cutters, to make a similar cutter, adapted to trim any new style of sole edge which might be brought to him and which he had never before seen, provided such sole edges had such configuration as it was possible to cut with a molded edge-cutter?

Ans. I should think it would.

Int. 46. Please state to what extent, if any, these cutters were made of varying widths and styles or outline for trimming soles of various thicknesses and outlines of edge.

Ans. Well, the sizes range from No. 1 to No. 48. I think I have made them from less than one thirty-second up to seven-eighths of an inch.

Int. 47. Were or not these various cutters made with various outlines of edges, as the styles of the outlines of the sole edges were changed by manufacturers?

Ans. They were.

Recross-examination:

Cross-int. 48. Did you ever read the complainants' patent?

Ans. Don't know that I ever did fully. I just saw and read the claim—I think that was the one—here to-day.

Cross-int. 49. What experience, if any, have you had in the manufacture or use of rotary cutters for trimming the sole edges?

Ans. None.

(Witness explains, with reference to the Brown patent cut-
457 ter, that he finds a freeing on the sides of the teeth the same as are the teeth in Complainants' Exhibit Defendants' Cutter.)

JACOB B. MANN.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Allister S. Jones.

BOSTON, *Aug.* 31, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Allister S. Jones; twenty-eight; Boston; salesman of edge-trimmers.

Int. 2. Are you acquainted with the business of trimming the edges of boot and shoe soles with rotary cutters?

Ans. Yes.

Int. 3. In what place or places have you been engaged in that business, and for how long a time?

Ans. I have worked for A. R. Jones & Co. about three years trimming sole edges at 280 East Dover street, Boston, Mass.

Int. 4. State whether you have heretofore used in trimming boot and shoe sole edges the machine known as the Busell edge-trimmer, having a hollow shaft and a small shaft arranged within such hollow shaft, a rotary edge cutter or trimmer, and an adjustable rand-trimmer. And, if so, when did you first use such trimmer and how long did you use it?

Ans. I have; about three years ago. How long I cannot say exactly; I should judge about three or four months.

Int. 5. Could you or not with that machine trim at the same time or at one operation both the edge of the sole and the rand between the sole and upper?

Ans. I could.

Int. 6. Had you seen the Busell machine, such as you used, in use by others before you used it yourself; and, if so, how long a time had you seen it before you used it?

458 Ans. I had seen it used, perhaps, about a week before I used it.

Int. 7. Have you seen the present so-called Busell trimming machine made and sold by the Busell Trimmer Company in use; and, if so, does it have a cutter like the one now shown to you, marked "Defendants' Exhibit Complainants' Cutter, E. H., sp'l ex'r," and now put in evidence?

Ans. Yes; I have. It does.

Int. 8. Is it practical with the Busell machine, having such a cutter, to cut out the rand and trim the sole edge at the same time, or is it necessary and is it the practice to first cut out the rand with a separate hand tool and then trim the sole edge with the rotary cutter?

Ans. It is not (in answer to first branch of the question). It is necessary and it is the practice to first cut out the rand with a separate tool.

Int. 9. Have you seen the so-called Corthell edge-trimming machine in which there are two arbors, one above the other, one carrying the rand-cutter and the other the edge-cutter? And, if so, state whether with the two both the rand and the edge can be trimmed.

Ans. I have. Both the rand and the edge can be trimmed with the two.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 10. What sorts of machines have you used for trimming shoe soles for Jones & Co. during the last three years?

Ans. Used the Busell edge-trimmer, Corthell edge-trimmer, and the Coté trimmer. I think it is the Coté or Whittemore trimmer; they call it both ways.

Cross-int. 11. Is this cutter, Exhibit Defendants' Cutter, the same as those used in Jones & Co.'s Corthell machine?

Ans. I have used this kind upon their machine.

Cross-int. 12. What is the work done by these ridges on that side of the cutter which is next to the rand guide when in use?

Ans. That simply cleans the upper edge.

Cross-int. 13. What you mean is, I suppose, it cuts off a part of the upper surface of the sole next the "upper" of the shoe?

459 Ans. A very small part.

Cross-int. 14. What do you believe to be the rand of a shoe; isn't it the upper surface of the sole next to the upper?

Ans. The rand extends from the outer edge of the sole to the upper on the upper side of the sole.

Cross-int. 15. Don't you think it all right to call those ridges on defendants' cutter, which are next the rand guide when in use, a rotary rand-cutter or rand knife, or some equivalent term? If not, what do you call them?

Ans. I suppose you may call it anything you choose, but it does not take out the rand, consequently, I think, ought not to be called a rand-cutter. I have no special name for them.

Cross-int. 16. As I understand your testimony, you have already said these ridges did cut out a portion of the rand, but your last answer seems to contradict this. Please state whether they cut out a portion of the rand or not, and also whether they cut out anything else but the rand.

Ans. They take out a slight portion of the upper edge, but not the whole rand. They don't cut anything else that I know of, not if you use the machine with care.

Cross-int. 17. By whom are you now employed as salesman of edge-trimmers?

Ans. The Corthell Manufacturing Company.

Cross-int. 18. How long have you been so employed?

Ans. Since the middle of May last.

Cross-int. 19. What is the meaning of these figures and letters: "M. No. 20, M. C. 1½ L.," on Exhibit Complainants' Cutter, and "No. 16, M. C. R. L., on Exhibit Defendants' Cutter?

Ans. The "No. 20" refers to the thickness of edge which it trims or size; "M. C." is medium convex, and "1½ L." refers to this part of the cutter that comes next to the rand guard, the "lip." The first "M.," I do not know what it refers to. No. 16 refers to the size or thickness of the edge; "M. C." medium convex. "R. L.," I never knew what it did mean.

Redirect:

Int. 20. You have been questioned in relation to the operation of the small projections next to the rand guide on Exhibit De-
460 fendants' Cutter. Now, whether the main body of the rand is first taken out with the hand tool or with a separate rotary cutter, as in the Corthell machine, is or not the operation of said small projections to impart a uniform bevel or mold to the rand by slightly cutting away the higher projections left them by the preceding tool?

Ans. The main body of the rand is taken out by a hand tool. This projection on the cutter is to remove any slight roughness and bevel uniformly the outer edge of the rand.

(Counsel for defendants here puts in evidence copies of United States letters patent No. 188,337, issued to J. H. Busell March 13, 1877, reissue No. 8239, dated May 21, 1878, and No. 210,006, dated November 19, 1878, and marked "Defendants' Exhibit Busell Patent 1, Busell Patent 2, and Busell Patent 3, E. H., sp'l ex'r.")

ALLISTER S. JONES.

Attest: EUGENE HUMPHREY,
Special Examiner.

(Adjourned.)

Deposition of Jacob P. Thompson.

BOSTON, *September* 2, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Jacob P. Thompson; 40; Brockton; shoemaker.

Int. 2. How long have you followed the business of shoe manufacturer?

Ans. Thirty years.

Int. 3. Are you familiar with the edge-trimming machine known as the Busell machine, in which are used a hollow arbor having an edge-trimming cutter, a flexible spindle arranged inside the hollow arbor, and a rand-cutter arranged on the spindle?

Ans. Yes, sir.

Int. 4. How long have you known it, and where?

Ans. Four years; in different places—Brockton, Marlboro', and Worcester.

461 Int. 5. Have you used them in your own factory; and, if so, how long?

Ans. Three years.

Int. 6. To what extent will these machines trim the edge of the sole and cut out the rand, at the same time?

Ans. To a very small extent, so far as my experience has been with them.

Int. 7. Have you heretofore used the edge-trimming machine known as the Bolling machine; and, if so, how long have you used it, and whether you are using it at the present time at your factory?

Ans. I should judge I had used that about six months or a year, between six months and a year; am not using it at the present time.

Int. 8. Are you using at the present time at your factory the Busell machine which has been inquired about?

Ans. Yes, sir.

Int. 9. Have you used and are you now using at your factory the so-called Busell machine, having cutters like that now shown you and marked "Defendants' Exhibit Complainants' Cutter?"

Ans. Yes, sir.

Int. 10. Is it practical and do you cut the rand with these cutters; and, if not, how do you cut the rand?

Ans. No, sir; we have a knife that we use by hand, called a rand knife.

Int. 11. How many shoes do you manufacture when running at your full capacity, and do you cut the rand from all, as you have stated; if not, what portion do you so cut by hand?

Ans. Well, from eighty to one hundred cases, twenty-four pair cases, per day. We cut the whole of them by hand.

Int. 12. Please state in what places you have seen machines in

operation having the solid cutter last inquired about, and whether you ever saw the rand cut entirely by such cutters.

Ans. Brockton and South Abington. No, sir.

Int. 13. Is it practical to trim the edge and cut the rand at one operation with these cutters, in your opinion, based upon your experience?

Ans. I never saw it done. I should say not.

Int. 14. When did you first, if at all, see or know of edge-
462 trimming machines having the sole-edge cutter upon one arbor and the rand-cutter upon another arbor, both in the same machine?

Ans. I never saw one till about a year ago.

Int. 15. When did you first see a rand-cutter without the edge-cutter mounted upon a rotary shaft or arbor?

Ans. About three years and a half ago.

Int. 16. Please state, if you know, who made it or was using it.

Ans. Samuel N. Corthell made it.

Int. 17. Have you ever seen or known any rotary machine which would cut a rand in good, practical shape, except such as have the rand-cutter mounted upon a shaft or arbor separate from or without the edge-cutter?

Ans. No, sir.

Int. 18. Are you familiar with edge-trimming tools like those now shown you, marked "Defendants' Exhibits Dunham Edge Cutter and Snell and Atherton Cutter," and with the use or operation of the same?

Ans. Yes, sir.

Int. 19. Please state whether or not these tools are as well adapted to trim the sole edge and take out the rand at the same operation as the complainants' cutter which as been shown you—that is, what is the comparative efficiency of the several cutters for the purpose stated?

Ans. Well, I don't see any difference; one will do just as well as the other.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 20. What part of the sole is cut by the ridges on these two cutters, Exhibits Defendants' Cutter and Complainants' Cutter, which are next the rand guide when the cutters are in use?

Ans. Well, all that I ever see them cut is what the knife jams over. It jams over a little feather, and this rand knife causes it to take that feather off.

Cross-int. 21. Have you ever used the trimmer called the Corthell trimmer?

Ans. Yes, sir.

463 Cross-int. 22. And how long have you used them?

Ans. Have never had much experience, but have trimmed several cases with them. They are not used in the factory where I work.

Cross-int. 23. Did you have anything to do with the getting up of this tool, Exhibit Thompson Rand and Sole Edge Trimmer?

Ans. Yes, sir.

Cross-int. 24. Do you think there is no substantial difference between Exhibit Thompson Rand and Sole Edge Trimmer and Exhibit Complainants' Cutter?

Ans. No great difference; no.

Cross-int. 25. What is the purpose for which you designed the small piece of steel, which is in the groove across one face of the smaller rotary cutter, in Exhibit Thompson Rand and Sole Edge Cutter?

Ans. To take out the rand.

JACOB P. THOMPSON.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of William J. Martland.

BOSTON, *September* 7, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Please state your name, age, residence, and occupation.

Ans. William J. Martland; 51; Brockton; shoe-tool manufacturer.

Int. 2. How long have you been engaged in the business of manufacturing shoe tools, or how long have you worked at that business in any capacity?

Ans. Have worked at it twenty-nine years; have been engaged in manufacturing, as part owner in the business, about twelve years.

Int. 3. Are you familiar with the tool now shown you, marked Defendants' Exhibit Dunham Edge Cutter; and, if so, how long have you known it and what have been your means of knowing it?

Ans. I am; twenty-nine years. I have made them twenty-nine years ago and until 1871 or 1872, before we stopped making them.

464 Int. 4. Please examine the tools now shown you, marked respectively Defendants' Exhibit Snell & Atherton Cutter and Defendants' Exhibit Snell & Atherton Cutter No. 2, and state whether you are familiar with the same; and, if so, how long you have been familiar with the same and your means of knowing them.

Ans. I am. I made some of them twenty-nine years ago.

(Counsel for defendants here put in evidence the tool marked "Defendants' Exhibit Snell & Atherton Cutter No. 2, E. H., sp'l ex'r.")

Int. 5. To what extent have tools like these exhibits been manufactured during the past twenty-nine years and are they being now manufactured; and, if so, by whom?

Ans. Well, a few hundred. The Dunham shoe plane soon ran

those out; none been manufactured for twenty-five years that I know of.

Int. 6. Were these exhibits, Snell & Atherton cutters, provided with clearance of the teeth; and, if so, how did you give them such clearance?

Ans. They were; used to take a little piece of steel after we got ready to harden them, a little steel lever similar to a screw-driver, only we didn't taper the end similar to a screw-driver, and with it sprung the teeth back a little, so as to make the front of the tooth a little higher than the back of it, a very little, just enough to show it, so as to give it a cut.

Int. 7. Were or not these Exhibits Snell & Atherton Cutters, when first made, twenty-nine years ago, as stated by you, molded across the entire face of the teeth like these exhibits?

Ans. Well, these were both made before more than twenty-nine years ago. Yes; they were, and a great many different styles, too.

Int. 8. Please state how, as nearly as you can, how great a variety of styles or forms of outline these cutters were made, as just stated by you.

Ans. Fifty or a hundred different varieties, sure.

Int. 9. To what extent or variety of styles and patterns have tools similar to the Exhibit Dunham Edge Cutter been manufactured and sold?

Ans. Fifty or a hundred different styles of those.

465 Int. 10. Please state as nearly as you can the average yearly production and sale of tools like this Exhibit Dunham Edge Cutter.

Ans. About four thousand a year, I should think.

Int. 11. Are you familiar with the tool now shown you, marked "Defendants' Exhibit Hazard's Improved Dunham Edge Cutter, E. H., sp'l ex'r" (now marked and put in evidence by counsel for defendants)? And, if so, state how long you have known it and to what extent have they been made and sold.

Ans. I am. They have been sold some three or four thousand a year. They reblade about twenty-five hundred a year, which takes off the sales of new ones; commenced manufacturing and selling them in 1870, the same year we got the patent on them. I think it was about March when I made the first one of them.

Int. 12. What are the facilities for sharpening this Hazard tool? Please explain it.

Ans. We take out the screw next to the handle and tip the blade back, so as to put it on a grindstone or emery wheel.

Int. 13. How were the teeth in tools like Exhibits Snell & Atherton, Snell & Atherton No. 2, and Dunham Edge Cutter sharpened?

Ans. We sharpened with a thin file on the front of the teeth; never touched the molded edge.

Int. 14. Please examine the two exhibits, Snell & Atherton Cutters, and state, if you know, why one is beveled on the side next to the lip and the other is not.

Ans. That is done by the man that files it; when he mills it down in a lathe, if he leaves one lip thick, after he gets the mold-

ing edge all filled up, then he has to bevel it off to bring it nearly up to an edge. The Exhibit "2," you will notice, he sawed down to a very thin lip, and consequently did not have to do any beveling; always calculate to have them so as to give a little bevel, from $\frac{1}{32}$ to $\frac{1}{16}$; nothing very particular about that.

Int. 15. Please examine the paper now shown you, marked Defendant's Exhibit Snell & Atherton's Catalogue, and state whether you have heretofore seen the same or others like it; and, if so, when first and your means of knowledge in relation to the same.

Ans. I have, in 1876. It was issued by the firm of Snell & Atherton, and I was one of the firm at the time, and am now a member of that firm.

466 Int. 16. How extensively were these catalogues circulated by your firm?

Ans. Sent them to all the civilized countries where shoe tools are used and to every State in this country.

Int. 17. At the time of issuing this catalogue, in 1876, as stated, were you manufacturing shoe-edge finishing tools like or similar to the Dunham edge-cutter, adapted to form the several styles of shoe edges illustrated in this catalogue, and were you or not making at that time these edge tools, adapted to trim other styles of edge than those shown in this catalogue? If so, state the extent of variety.

Ans. We were; all styles they were using. It would be hard to tell the number of varieties; fifty to a hundred or more.

Int. 18. At the time of issuing this catalogue, in 1876, were or not the several styles of edge tools shown therein old and well known; and, if so, how long, to your knowledge, had they been old and well known?

Ans. They were; over twenty years. I made all those styles myself over twenty-five years ago.

Int. 19. Had other catalogues having illustrations of styles of sole edges been issued before 1876; and, if so, by whom, if you know?

Ans. I think E. S. Snell & Co. issued some two or three years before we did.

Int. 20. Do you know James H. Busell, of the so-called Busell Trimmer Company; if so, how long have you known him?

Ans. I do; some six or eight years.

Int. 21. Have you ever had any communication or interviews with him in relation to sole-edge trimmers or cutters? And, if so, please state what the substance of your interview with him was; what was said by either or both of you.

Ans. I have. I gave him one of these Snell & Atherton cutters three or four years ago. I showed him one of them and told him how we made them when we used to make them; showed him how we sprung back those teeth to give them the cut, and then he wanted to know if I would lend it to him a little while, and I let him have it and he has got it yet.

Int. 22. Where did this interview take place?

Ans. In the shop at Snell & Atherton's.

467 Int. 23. Do you know O. L. Noble, of the Busell Trimmer Co.; and, if so, how long have you known him?

Ans. I do; I should think four or five years.

Int. 24. Have you ever had any interviews with him in relation to edge-trimmer cutters; and, if so, when first and where?

Ans. I have; three or four years ago, I should say, in our shop, Snell & Atherton's, at Brockton.

Int. 25. Please state, as nearly as you can, the object of his being there, if he stated it, and what was said by either of you in relation to edge-cutters and what was done, if anything. Please answer as fully as you can.

Ans. One object was to get some old blades off these planes (Hazard's improved Dunham cutter). He wanted to get the different styles and varieties, so he could use them for a tool to cut out their templates. I think that was what he called them. I gave him a lot of them, of different styles and forms; probably gave him fifty or more.

Int. 26. Did he or not state, in substance, that he wished to obtain the blades of you, as you have stated, for the purpose of duplicating them in rotary cutters or to aid him in making rotary cutters of the same style?

Ans. He did.

Int. 27. Are you familiar with the use of rotary cutters for trimming boot and shoe sole edges, as practiced in shoe manufactories? And, if so, please state your means of knowledge.

Ans. No; I am not much familiar with them.

Int. 28. Are you familiar with the various styles of edges produced by them, and does or not your business of manufacturing hand tools lead you to be familiar with the work performed by rotary cutters?

Ans. I am; it does.

Int. 29. Have you known or seen any different styles of boot or shoe edges produced by rotary cutters which were not old and well known long before the use of rotary cutters for that purpose?

Ans. I have not.

Int. 30. Please state, if you know, whether rotary cutters are used to any material extent for the purpose of trimming or cutting out the rand and trimming the sole edge at one and the same operation.

468 Ans. I don't know of any that are used for doing the same at one operation.

Int. 31. Please state your means of knowledge upon this branch of the business.

Ans. All I have seen used in Brockton have a man to take out the rand with a welt-trimmer—a hand tool—before it goes to the rotary machine. There may be some who don't do it, but I never saw them.

Int. 32. Do you or not manufacture a hand tool for the express purpose of taking out the rand or welt; and, if so, to what extent do you make and sell the same—what number per year?

Ans. I do; make some six or eight hundred dozen per year.

Int. 33. So far as you know, are or not these hand welt or rand tools used in connection with the Busell rotary edge-trimmers and for the purpose of cutting out the welt before subjecting the shoe edge to the action of the rotary cutter? Please state from your own knowledge and observation.

Ans. So far as I know, they are.

Int. 34. Please state in what manufactories you have seen the hand-welt tool used in connection with the Busell trimmer.

Ans. Have seen them in W. A. Howard's and some of the other shops—I forget which ones now—in Brockton.

(Noon recess.)

Cross-int. 35. Were or not the Exhibit Hand Tools which have been shown you made both rights and lefts—that is, for use for both right-handed and left-handed persons?

Ans. We always made them both right and left handed.

Int. 36. Please examine the tool now shown you and marked "Defendants' Exhibit Mann's Edge Cutter" and state whether it is a right or left hand cutter.

Ans. This is a left-hand cutter—that is, made to be used by a left-handed person.

(Cross-examination waived; and counsel for complainants objects to the entire deposition as being wholly immaterial and irrelevant to any issue in this case; and, in order to prevent any further waste of time (as he regards it), he here formally admits all and each one of the tools marked Exhibits "Mann's Edge Cutter," "Snell & Atherton Cutter" and "Snell & Atherton Cutter No. 2," "Dunham
469 Edge Cutter," "Hazard's Improved Dunham Edge Cutter" were old and well known before the invention described in the patent sued on, and he gives notice that he will object to any further evidence as to any of the exhibits above named except such as may tend to show a substantial identity or likeness between them and the complainants' cutter. He also admits that Exhibit Snell and Atherton Catalogue was well known to the trade, including the complainant company and the patentee Orcutt, before the invention described in the complainants' patent.)

WILLIAM J. MARTLAND.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Albert Leavitt.

BOSTON, *Sept.* 8, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Albert Leavitt; 49; Boston; machinist.

Int. 2. Have you heretofore been in the employ of David Whitte-

more? And, if so, please state when you commenced and when you left off working for him.

Ans. I have. I think it was 1876 I went to work for him, and left off in 1880.

Int. 3. Did you or not know of a certain arrangement or consolidation of interests between said Whittemore and the Busell Trimmer Company in relation to the matter of boot and shoe edge trimming machines or interests therein?

Ans. I did.

Int. 4. While you were working at Whittemore's did you know anything in relation to Samuel N. Corthell's inventing and making a cutter like that shown in his patent No. 207,395? And, if so, please state how early said cutters were made—whether before or after his application for a patent.

Ans. I knew that he made it in the spring of 1878.

470 Int. 5. When was the arrangement made between Whittemore and the Busell Company, as near as you can state?

Ans. I think it was in the fall of 1877.

Int. 6. Please state whether or not O. L. Noble, agent or manager of the Busell Trimmer Co., was in the habit of visiting Whittemore's factory after the arrangement was made between Whittemore and the Busell Co., and whether Whittemore was making edge-trimming machines which Noble was looking after.

Ans. He was.

Int. 7. Please state whether or not F. M. Stevens was at any time in the employ of Whittemore, and whether his services were placed at the disposal of O. L. Noble for the purpose of experimenting upon rotary cutters for trimming machines. If so, when was it, and how long were his services at the disposal of said Noble for that purpose?

Ans. He was in Mr. Whittemore's employ, and worked under Mr. Noble's instructions, experimenting and doing whatever he required. It was in the spring of 1878, or along towards the first of the summer—May or June; I don't know which; some six weeks.

Int. 8. Did you have any conversation with O. L. Noble in relation to rotary cutters for trimming boot and shoe soles? And, if so, please state when it was and where, and the conversation, or the substance of it, as nearly as you can.

Ans. I did. It was in March or April—early spring—of 1878, at the office in Mr. Whittemore's factory. I suggested to Mr. Noble the idea of making a cutter after the Brown & Sharpe cutter. I also spoke in regard to what effect the patent on the Brown & Sharpe cutter would have in regard to its use for boots and shoes or leather.

Int. 9. What did Noble say or do, if anything, in connection with your suggestion?

Ans. I think he made me no answer, if my memory serves me right; but I was impressed with the idea that he took the suggestion.

Int. 10. Was the cutter making or experimenting which had been going on at Whittemore's for Noble, as agent of the Busell Trimmer Co., taken away from there at or about the time of your making the

suggestion to Noble; and, if so, whether before or after you made the suggestion, or when?

471 Ans. Noble's experimenting was done after that; we were at work on the Corthell cutter at that time.

Int. 11. Do you know where the cutter making and experimenting by Noble was transferred to after it was taken from Whittemore's? If so, please state.

Ans. The experimenting was taken to Warren Haskell's, 36 Charlestown street. The making of cutters was carried to Brown & Sharpe's.

Int. 12. Please state, if you know, whether William D. Orcutt was employed at the place in Charlestown street where the experimenting was taken, as just stated by you, at or about the time when the experimenting was transferred there.

Ans. I know by Mr. Noble; that is all the way I know; have heard him speak of it.

Int. 13. What did Noble say about his being there, or whose employ he was in?

Ans. Well, in our general conversation together he would often speak to me about Orcutt's experimenting for him on other work.

Int. 14. Do you recollect what kind of cutters, if any, were made by Stevens for Noble while he was under Noble's direction at Whittemore's factory?

Ans. Mr. Stevens worked directly under Mr. Noble's instructions, and I could not describe the cutters that he made for him.

Int. 15. Were you not at that time foreman of Whittemore's factory, and having general charge of the work there?

Ans. I was.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 16. Where do you work now, and how long have you been there?

Ans. I am in business for myself at 271 Franklin street, in the firm of Leavitt & Field, machinists; have been there one year and ten months.

Cross-int. 17. Can you now tell with certainty when you entered David Whittemore's employ—in what part of the year 1876?

Ans. The second day of November.

472 Cross-int. 18. And when did you leave his employ?

Ans. I left his employ the last week in September, two years ago.

Cross-int. 19. What class of work had you done before you went to Whittemore's employ?

Ans. I was formerly in Whittemore's employ before; have been in the general machine work for twenty-nine years.

Cross-int. 20. Had you had any experience in any kind of machines relating to sole edges before November 2, 1876? If so, state generally where and what the machines were.

Ans. I built a few of the Coté machines some four years before at 26 Charlestown street, the shop of the Shoe Machinery Co.

Cross-int. 21. Was that the whole of the experience you had had prior to Nov. 2, 1876, with machines relating to sole edges?

Ans. It was.

Cross-int. 22. Please describe these Coté machines enough to give us a general idea of their construction and the work they were designed to do.

Ans. Well, they were made on a frame designed by Louis Goddu, with a shaft running through the bottom of the base, standing parallel with one running through the head, the shaft in the head containing the rotary cutter. We made setters and trimmers both for setting and trimming the sole edges of boots and shoes.

Cross-int. 23. How long were you at work for the Shoe Machinery Company?

Ans. Three years and ten months.

Cross-int. 24. From what time to what time?

Ans. I went to work for them in 1872, week after the big fire; I worked for them to 1876.

Cross-int. 25. Where did you work between the time you left them and Nov. 2, 1876?

Ans. I worked for myself at 138 Congress street, in Andrew Morse's building.

Cross-int. 26. Did you do anything on shoe machinery while you worked in Andrew Morse's building in 1876?

Ans. I worked on sewing-machines and pegging-machines, nothing about sole-edge machines.

ALBERT LEAVITT.

Attest: EUGENE HUMPHREY,
Special Examiner.

473 *Deposition of Isaac A. Dunham.*

BOSTON, *September* 7, 1882.

Direct examination by T. W. PORTER, Esq., of counsel of defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Isaac A. Dunham; 54; Brockton; machinist.

Int. 2. Have you heretofore been engaged in the manufacture of shoe-sole-edge-finishing tools; and, if so, how long did you follow that business?

Ans. I was not engaged in the manufacture of the tools, but I held the patent; they were made by Snell & Atherton.

Int. 3. Do you know O. L. Noble, agent of the Busell Trimmer Co., so called?

Ans. I have seen him; think I should know him now.

Int. 4. Were you ever present at any interview between him and William J. Martland?

Ans. I was.

Int. 5. When was said interview? State it as nearly as you can state.

Ans. I should say it was nearly four years ago.

Int. 6. Please state where this interview was, what was said by said Noble or Martland, and what was done at that time, if anything.

Ans. It was at Snell & Atherton's shop, in Brockton. Mr. Noble applied to Mr. Martland for some of their worn-out cutters of edge planes, and stated that he wanted to use them to produce a fac-simile for a cutting tool for their own purpose. Mr. Martland gave him quite a lot of them, of the different styles. I should think he gave him a pint or more at that one time.

Int. 7. Were the cutters that you speak of the same as the removable piece or blade on the Exhibit Hazard's Improved Dunham Edge Cutter?

Ans. They were.

Int. 8. Please examine the drawings in the patent now shown you, marked "Complainants' Exhibit Complainants' Patent," and state whether or not any of the cutters which were given to Noble by Mr. Martland, as you have stated, were adapted to form the edge
474 of a shoe sole the same as would a cutter formed like that shown in the drawings referred to.

Ans. I should say that there were several that would make just that edge.

Int. 9. Do you know James H. Busell, of the Busell Trimmer Co., so called?

Ans. I do.

Int. 10. Were you ever present at any interview between said Busell and William J. Martland? If so, please state when it was, as near as you can, where it was, and what was said or done at such interview.

Ans. I was. I should think it was about seven years ago—I couldn't tell exactly—in Snell & Atherton's shop, Brockton. I saw Mr. Martland give him one of the old edge "breaks" or cutters—that is what they used to call them—like Exhibits Snell & Atherton Cutter and Snell & Atherton Cutter No. 2. I don't remember the conversation.

ISAAC A. DUNHAM.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Joseph E. Crisp.

BOSTON, *September* 15, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Joseph E. Crisp; 43; Somerville; machinist.

Int. 2. Have you heretofore had occasion to examine and familiarize yourself with letters patent and the invention or subject-matter thereof, and have you heretofore testified in patent causes? And, if so, please state generally the extent of your experience in these matters and the length of time you have been so engaged.

Ans. I have; and also by practical experience in shops for the past twenty years. I think I am familiar with all classes of cutters.

475 For the last ten years I have been called on at times to testify as a mechanical expert in causes before the courts and in the Patent Office relating to sewing-machines, lasting machines, and other leather machinery. I am familiar with drawings, having for the last twenty years practiced the designing of machinery.

Int. 3. Have you seen and examined the copy of letters patent filed as an exhibit in this case, marked "Complainants' Exhibit Brown Gear Cutter Patent;" and, if so, do you understand the same?

Ans. I have and do.

Int. 4. Have you examined the following exhibits filed by the defendants: Snell and Atherton cutter, Snell and Atherton cutter No. 2, Mann's edge-cutter, Dunham's edge-cutter, and Hazard's improved Dunham edge-cutter, and do you understand the same?

Ans. I have and do.

Int. 5. Have you examined and do you understand the thing shown, described, and claimed in Exhibit Complainants' Patent No. 238,303?

Ans. I have and do.

Int. 6. Assuming that the several tools referred to in interrogatory 4 as defendants' exhibits were old and well known at the date of Orcutt's invention of the cutter shown in Exhibit Complainants' Patent, and in view of the Brown patent, what, if anything, beyond the ordinary knowledge and skill of the mechanic, was requisite to make a Brown & Sharp cutter which would have a cutting edge of suitable configuration to trim the sole of a boot or shoe?

Ans. A mechanic accustomed to manufacture the Brown cutter would require nothing but a template of the desired form to manufacture the Orcutt cutter, so far as relates to form, cutting edge, and clearance.

Int. 7. Have you examined and are you familiar with the following letters patent, copies of which are filed by defendants as exhibits in this case: I. A. Dunham, No. 15176; James C. Knights, No. 157,476; S. N. Corthell, No. 207,395; J. H. Busell, No. 188,337; J. H. Busell, reissue No. 8239; J. H. Busell, No. 210,006; A. Bolling, No. 192,616; Tayman, reissue No. 9073; J. Harrington, No. 82402?

Ans. I have examined them and am familiar with them, so far as relates to the cutters or trimming tools.

476 Int. 8. In view of these patents and in view of the Brown gear-cutter patent and the Exhibit Brown Patent Gear Cutter, now shown to you, in your judgement, did the man who first made a cutter like that shown in complainants' patent exercise anything more than the ordinary knowledge and skill of a mechanic, knowing what had been done by Brown and others, as shown in the patents to which your attention has been called?

Ans. He did not.

Int. 9. In answer to Int. 6 you state that a mechanic accustomed

to manufacture the Brown cutter would require nothing but a template of the desired form to manufacture the Orcutt cutter. Please state what you understand by the term template.

Ans. A template, as understood by mechanics, in this case would be a form cut in the edge of a piece of thin sheet metal the reverse of the desired shape of the cutting edge of the cutter; in other words, a model of the edge or form desired to be produced by the cutter upon any material operated upon, this being used to shape the edge of the cutter or to make the tool shaping such edge, which would be similar in contour to the template.

Int. 10. Please state whether or not the teeth shown in the Defendants' Exhibits Snell & Atherton Cutter, Snell and Atherton Cutter No. 2, Dunham Edge Cutter, and Hazard's Improved Dunham Edge Cutter and the diagrams shown in Defendants' Exhibit Snell & Atherton Catalogue, now shown to you, severally represent examples of what you term a template in your preceding answer.

Ans. They do not represent what I termed a template, but they represent tools formed by the use of a template. For instance, the diagram marked 4 in Exhibit Snell & Atherton's Catalogue is formed by a template that would produce the tool identical in inclines with the Orcutt cutter, as shown by figure 3 in Complainants' Exhibit Complainants' Patent.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 11. Which of these tools, Defendants' Exhibits Mann's Edge Cutter, Snell & Atherton Cutter, Snell & Atherton Cutter No. 2, Dunham Edge Cutter, and Hazard's Improved Dunham Edge Cutter, do you believe to be substantially the same as the rotary cutter for trimming sole edges described in Exhibit Complainants' Patent?

477 Ans. So far as relates to operation upon the leather they are not substantially the same as the Orcutt cutter, that being revolved as the shoe is moved against it, the other devices, as specified, being tools moved by hand against the leather or edge to be formed. As relates to form and convenience in sharpening, I find them substantially the same, the Dunham and improved Dunham being sharpened upon the cutting face in one case by removing a block or guide from the front of the cutter, in the other by swinging the cutter back. Exhibits Snell & Atherton Cutter and Snell & Atherton Cutter No. 2 can be sharpened by a thin wheel or tool on the face, and Defendants' Exhibit Mann's Edge Cutter, in order to be sharpened upon the face, would have to be separated by removing the binding screw, it being made in three parts.

Cross-int. 12. What part of Orcutt's cutter do you think is substantially the same as the part you have called the block or guide in these two cutters, Exhibits Dunham's Edge Cutter and Hazard's Improved Dunham's Edge Cutter?

Ans. In the cutter *per se* the block or guide performs the same function as that performed by the rand guide when used in combination with the Orcutt cutter, limiting the depth of the cut.

Cross-int. 13. Do you think that the rand guide, which no doubt forms a part of the Orcutt cutter when in use, is substantially the same thing as the block or guide in these two cutters, Exhibits Dunham Edge Cutter and Hazard's Improved Dunham Edge Cutter?

Ans. The rand guide in the Orcutt cutter limits the whole depth of the cut made by the cutter; the block or guide in the Dunham cutters limits the depth of an individual shaving made by that cutter, several shavings, perhaps, being required to reduce the edge of the sole to the proper distance from the rand, both governing the cutting of the tool.

Cross-int. 14. You have not answered my question, I think. Please reconsider it and answer it again if you think you have not fully answered it.

Ans. Otherwise than I described it before, it is not the same thing.

Cross-int. 15. What practical experience have you had in the use of the Orcutt cutter in trimming sole edges?

Ans. None; but I have had experience in cutters for cutting metals, wood, and leather.

478 Cross-int. 16. What makes you think that in the practical use of the Orcutt cutter the rand guide or guard acts to determine the amount of material cut off from the sole edge?

Ans. I understand that the Orcutt cutter is used in combination with heel and sole trimming machines invented and patented by J. H. Busell, and as I understand those machines the rand guide is supposed to enter in the rand between the upper and the outer sole, and, by stopping upon stitching or pegging, connecting the two, thus limiting the depth of the cut.

Cross-int. 17. I suppose for the same reasons you think the triangular tooth in these two exhibits, Snell & Atherton Cutter, Snell & —— Cutter No. 2, and the corresponding teeth in Mann's edge-cutter correspond with the rand guide used with the Orcutt cutter in the respects you have named. Am I right?

Ans. I do not remember having so expressed myself, these cutters acting like a scraper, after the fashion of the Orcutt cutter, and requiring, like that, the operation of more than one tooth to remove more than some fixed amount of material by the passage of that tooth over the material. The Dunham cutter without the guide could be driven to an injurious depth in the material operated upon. Understanding that the cutters under the question being driven or moved by hand no necessity exists for any device to prevent injury to the material by the cutters going to an undue depth outside the skill of the operator.

Cross-int. 18. You haven't answered the question. Please do so.

(Question repeated.)

Ans. No; you are not right.

Cross-int. 19. What part of the Orcutt cutter do you think substantially the same as the triangular tooth in Exhibits Snell & Atherton Cutter, Snell & Atherton No. 2, and the corresponding teeth in Mann's edge-cutter?

Ans. There is no part, this triangular tooth in the Snell & Atherton exhibit being only an incident in the manufacture, the correct form for cutting being shown by the succeeding teeth.

Cross-int. 20. What experience have you had in trimming sole edges?

Ans. None; but I have cut leather in various forms and rawhide with cutters.

479 Cross-int. 21. Don't you see, now that your attention is called to it, that those triangular teeth in the Snell & Atherton exhibits are the same things in substance as that you have called a block or guide in the Dunham exhibits?

Ans. I think not. They could be removed, and it would be difficult to force these cutters to an injurious depth, or they might be sharpened or undercut as the other teeth.

Cross-int. 22. Do you think that either of these cutters, Exhibits Thompson Rand and Sole Edge Trimmer, Brown Patent Gear Cutter, Brown & Sharpe Milling Cutter 1, Brown & Sharpe Milling Cutter 2, Rounds' Rand and Edge Cutter, and Colt's Armory Cutter, is substantially the same as the rotary cutter for trimming sole edges described in complainants' patent?

Ans. I believe that so far as relates to face and clearance of teeth the Brown patent gear-cutter, Brown and Sharpe milling-cutter 1, Brown & Sharpe milling cutter 2, and Colt's armory cutter are substantially the same as the Orcutt cutter.

Cross-int. 23. As I understand your answer you think that Exhibits Thompson Rand and Sole Edge Trimmer and Rounds' Rand and Edge Cutter are not substantially the same as the Orcutt cutter. Am I right?

Ans. I do not think they are substantially the same.

J. E. CRISP.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Edward C. Mitchell:

BOSTON, *October* 3, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Edward C. Mitchell; 41; Hartford, Conn.; machinist.

Int. 2. Please examine the cutter now shown you and state whether you have before seen the same; and, if so, where and when, as near as you can state.

480 Ans. Yes, sir; I saw it at Pratt & Whitney's, where I made it, at Hartford, Connecticut.

(Counsel for defendants here puts in evidence the cutter referred to and marked "Defendants' Exhibit Mitchell Cutter, E. H., sp'l exam'r.")

Int. 3. What was the occasion of your making this cutter and what instructions, if any, did you receive in relation to making it?

Ans. It was an order sent from the office, and that boot was sent with it (pointing to a boot on the table); no instructions whatever, except as to the size of the hole and diameter on the outside and to trim an edge like that on the boot.

(Counsel for defendants here puts in evidence the boot referred to and marked "Defendants' Exhibit Mitchell's Boot, E. H., sp'l exam'r.")

Int. 4. Have you stated all the instructions you received in relation to making this cutter?

Ans. Yes, sir; except that I was to charge my time to the Corthell Manufacturing Company.

Int. 5. Had you ever before had any experience whatever in making rotary cutters for trimming the edges of boots and shoes?

Ans. No, sir.

Int. 6. With a trimmed boot edge furnished as a pattern was there any difficulty whatever in making a cutter like Exhibit Mitchell Cutter?

Ans. No, sir.

Int. 7. Had you before that time had experience in making cutters for milling metals?

Ans. Yes, sir; twenty years' experience.

Int. 8. In your opinion, judging from your experience in making the Exhibit Mitchell Cutter, would there be any difficulty in any workman of fair experience in making cutters for milling metal in making a cutter that would trim a sole edge like the exhibit boot?

Ans. No, sir.

Int. 9. Please state the means and method by which you were enabled to copy the outline of the boot edge upon the periphery of the cutter, referring to any exhibits now before you.

Ans. In the first place, I filed a template to the edge of the boot; then I made a tool from that template, with which I made the cutter (referring to the template and tool on the table).

481 (Counsel for defendants here puts in evidence the tool and template referred to, marked "Defendants' Exhibit Mitchell's Forming Tool, E. H., sp'l exam., and Defendants' Exhibit Mitchell's Template, E. H., sp'l exam'r.")

Int. 10. Were the template and forming tool above referred to the only special tools necessary in order to produce the Exhibit Mitchell Cutter?

Ans. Yes, sir.

Int. 11. Would there, in your judgment, be any difficulty in forming a rotary cutter to trim any outline of sole edge that could be trimmed with a rotary cutter by any workman skilled in making metal milling tools, provided the sole edge was furnished as a pattern?

A. No, sir.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 12. What part of the work of trimming the sole edge is done by these small ridges at one side of the cutter—Exhibit Mitchell Cutter?

Ans. That is for trimming the inside of the sole, the bevel. I suppose—as much as I know about it—I am not a professional boot-maker. I merely made the cutter.

Cross-int. 13. You made that part from this boot—Exhibit Mitchell Boot—if I understand you?

Ans. Yes, sir.

Cross-int. 14. What prevents those small ridges from cutting the upper leather and injuring the boot, so far as you understand it?

Ans. If the edge of that boot was thinner, why, of course, it would cut it, but the edge being of that thickness, it can't hit the upper as it is now.

Cross-int. 15. What are these marks for on the flat side of Exhibit Mitchell Cutter?

Ans. Those are nothing—only a habit I have always had of putting my mark on a piece of work. The X means the quality of steel.

EDWARD C. MITCHELL.

Attest: EUGENE HUMPHREY,
Special Examiner.

482 *Deposition of Seymour Bunnell.*

BOSTON, *October* 5, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Please state your name, age, residence, and occupation.

Ans. Seymour Bunnell; 49; Hartford, Connecticut; tool-maker and contractor.

Int. 2. Where are you now employed and how long have you been so employed?

Ans. At Colt's armory, Hartford, Conn.; about twenty-seven years.

Int. 3. What branch of work at Colt's factory are you engaged in and how long have you been engaged in the same?

Ans. Tool-making and contracting; about twenty-seven years.

Int. 4. What classes of tools are you engaged in making and contracting to make?

Ans. Mills and fixtures; by mills I mean rotary milling tools.

Int. 5. Please state whether it is or not a well-known practice in the construction of milling tools to form them in gangs or sections instead of forming the entire cutter of a single piece of metal?

Ans. It is.

Int. 6. Which is the more common practice, in your judgment, to form them in sections or of a single piece?

Ans. In sections.

Int. 7. Please examine the drawing in Exhibit Tayman Reissue No. 9073, more particularly Figs. 11 and 15, and state whether the cutter or cutters therein shown, marked F, F^1, F^2, represent a well-known method of forming rotary cutters in gangs or sections.

Ans. They do.

Int. 8. Please state whether or not the methods of forming rotary cutters with so-called ratchet teeth, as shown in Tayman reissue, and with teeth having a flat front face like Complainants' Exhibit Defendants' Cutter, now shown you, are both common and well-known methods of forming such cutters.

Ans. They are.

Int. 9. How long has it been a common and well-known method of forming cutters with teeth having a flat front face and deep grooves, like Complainants' Exhibit Defendants' Cutter?

Ans. From sixteen to eighteen years.

483 Int. 10. Has it or not during that period been a common practice to construct rotary cutters with teeth having a flat front face and with great varieties of outline of peripheral face, according to the requirements of the work to be done?

Ans. It has.

Int. 11. Is it or not a fact that for some classes of work it is more convenient in sharpening cutters and keeping them in order to have them formed with ratchet teeth, while in other kinds of work the advantage is on the side of teeth having a flat front face?

Ans. It is.

Int. 12. Please state whether or not the convenience or facility of sharpening and keeping in order is not usually the controlling reason in deciding between the two kinds of teeth when forming cutters for any particular job.

Ans. It is.

Int. 13. Have you heretofore seen the cutter now shown you, marked Defendants' Exhibit Colt's Armory Cutter? If so, when first, by whom was it made, if you know, for what purpose was it intended, and for what purpose used, if any?

Ans. I have. I had it made under my supervision. It was made, I should say, about seven or eight years ago, and we have used it since and are using it now. It is used for cutting steel on what is termed the "double-action bolt" of the "double-action piston." What we term "double action" is "self-cocking."

Int. 14. Have you heretofore seen the cutter now shown you, marked Defendants' Exhibit Colt's Armory Cutter No. 2, E. H., spec'l exam'r? If so, please state when first, what material it was used upon, and how extensively used.

Ans. I don't know that I have seen this one before. I have seen similar cutters ever since I went into the armory. It is used upon steel, and very extensively. The reason I say steel is because we use nothing but steel to any extent.

(Counsel for defendants here puts the cutter referred to in evidence, marked as stated in the question.)

Int. 15. Have you heretofore seen the cutter now shown to you,

marked Defendants' Exhibit Colt's Armory No. 3, E. H., spec'l exam'r? If so, please state when first, what material it was used upon, and how extensively used.

Ans. This and similar cutters have been in use there right along all the time, as long as I have been in the armory. I should
484 say this (referring to exhibit) was used for sweeping cut on hammer, and it was very extensively used.

Int. 16. Have you heretofore seen the cutters now shown to you, marked Defendants' Exhibit Colt's Armory Cutters No. 4, E. H., spec'l exam'r? If so, please state when first, what material they were used upon, and how extensively used.

Ans. I have. They were made under my supervision in 1877. They were used on steel, on a piece designated "top lever" in Colt's shotgun—used on every lever that is made for the Colt gun.

(Counsel for defendants here puts in evidence the cutters referred to in the last two preceding questions and marked respectively as therein stated.)

Int. 17. Please state whether or not the teeth in Exhibit Colt's Armory Cutter and Colt's Armory Cutter No. 4 are freed back—that is, whether they have "clearance," so called.

Ans. They have.

Int. 18. Is there any difficulty in milling steel with teeth as thin as those in Exhibits Colt's Armory Cutter and Colt's Armory Cutter No. 4, provided the depth of cut or the "feed" is graduated with due reference to the teeth?

Ans. There is not.

Int. 19. Is there any difficulty whatever in sharpening cutters like those last inquired about by grinding the flat front face of the teeth with an emery wheel, and is or not that the usual method of sharpening such cutters?

Ans. There is not. It is the usual method.

Int. 20. Please state as near as you can the number of rotary cutters actually used in constructing either kind of pistol manufactured at Colt's armory.

Ans. It would be guess-work. I should think it would take one hundred and fifty different cutters, to take the operation all through.

Int. 21. How many different kinds of pistols do you make there?

Ans. I think there are twelve now. There are one or two kinds gone out of existence.

Int. 22. Would each of the twelve kinds you now make require the number of cutters which you have stated?

Ans. All but two. There are two of them, single barrel, breech-loading—not revolvers—that would not require so many cutters.

Int. 23. Would there, in your judgment, be any difficulty whatever in a workman of ordinary skill in making cutters
485 making or adapting such a cutter to cut any desired form of outline practicable for a rotary cutter, provided a pattern or drawing or sample of the work to be done was furnished him as a guide for shaping the cutter?

Ans. None whatever.

Int. 24. If rotary cutters were in common use for trimming boot and shoe sole edges and also hand trimming tools like Exhibits "Snell & Atherton Cutter," "Snell & Atherton Cutter No. 2," "Dunham Edge Cutter," and "Hazard's Improved Dunham Edge Cutter," would there, in your judgment, be any difficulty whatever in making a rotary cutter that would cut a path like either of said hand trimming tools by any person of ordinary skill in making rotary cutters?

Ans. None whatever.

Cross-examination by J. E. MAYNADIER, Esq., of counsel for complainants:

Cross-int. 25. Please state how the Colt's armory cutter No. 2 is sharpened.

Ans. On the edge, not on the face of the tooth. (Witness explains by pointing out that it is not on the face, but on the top of the tooth.)

Cross-int. 26. And Colt's armory cutter No. 3 is sharpened in the same way, isn't it?

Ans. It is; sharpened on the top of the tooth.

Cross-int. 27. What is the reason, in your opinion, for the clearance on one side of the teeth in Colt's armory cutter?

Ans. That is so that it shall not rub the piece of steel that lays at the side of the cutter when working on it.

Cross-int. 28. Please describe how Colt's armory cutter No. 4 is used—that is, its speed of rotation and whether it cuts a groove or not.

Ans. I should say the cutter run about one hundred and twenty revolutions a minute. The operation is to cut an angular cut across a piece to form a gear tooth on a lever, which operates like a bevel gear to shove a slide that unlocks the breech of the gun.

Cross-int. 29. Why are there two cutters in Exhibit Colt's Armory Cutter No. 4? Do they work together in any way?

Ans. They do; one cuts one side of the gear tooth and the other the other; there must be a right and left hand cutter.

Cross-int. 30. About how deep does each ridge on the side of each of the two parts of the cutter marked Colt's armory cutter No. 4 cut into the steel when the cutter is in use?

Ans. It cuts in about an eighth of an inch, but the stock
486 is nearly all removed by another cutter to favor these cutters. Where we use a cutter that is liable to break we favor it all we can.

Cross-int. 31. Why are these cutters, Exhibit Colt's Armory Cutter No. 4, liable to break?

Ans. Well, they are not a strong cutter. Any cutter brought to so sharp a point, you have to use it very delicate, as you do the point of a small drill.

Direct resumed:

Int. 32. Has it or not for years been a common practice to sharpen

the teeth of milling-cutters upon the top when ratchet shaped and upon the front when formed like Exhibits "Colt's Armory Cutter," "Colt's Armory Cutter No. 4," and "Defend's' Exhibit Complainants' Cutter" and Complainants' Exhibit Defendants' Cutter?

Ans. It has.

Int. 33. Has or not the method of sharpening cutters like Colt's armory cutter, Colt's armory cutter No. 4, Defendants' Exhibit Complainants' Cutter, and Complainants' Exhibit Defendants' Cutter by grinding the front flat face of the teeth been considerably practiced since the introduction of such cutters, and is not that one of the material advantages of forming a cutter in that manner?

Ans. It has and is.

SEYMOUR BUNNELL.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Samuel N. Corthell.

BOSTON, *October* 12, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Have you heretofore testified in this case?

Ans. I have.

Int. 2. Have you tested the efficiency of Complainants' Exhibit Brown Patent Gear Cutter and Defendants' Exhibits Colt's Armory Cutter No. 2, Colt's Armory Cutter No. 3, and Colt's Armory Cutter No. 4 by trimming shoe-sole edges therewith? If so, please state whether said cutters are adapted to trim the edges of boot and shoe soles, using any exhibits you may have to illustrate your answer.

Ans. I have. I find Colt's armory cutter No. 3, used together with ridges on the two outside edges, are adapted to trim the well-known style of round edge like the one I now hold in my
487 hand. (Shoe introduced in evidence and marked "Defendants' Exhibit Corthell Shoe No. 1, round edge, E. H., spec'l exam'r.") I find the thinnest cutter of the two, marked "Colt's cutter No. 3," adapted to trim the well-known style of shoe edges called "half round" or "round bevel," like the one I hold in my hand. (Shoe introduced in evidence and marked "Defendants' Exhibit Corthell Shoe No. 2, half-round edge, E. H., spe'l exam'r.")

I find "Colt's armory cutter No. 2" has an outline adapted to trim a "half-round" edge like the shoe which I have in my hand. (Shoe introduced in evidence and marked "Defendants' Exhibit Corthell Shoe No. 3, half-round edge, E. H., spec'l exam'r.")

I find "Colt's armory cutter No. 4" has an outline adapted to trim a half-round edge on a double sole like the shoe I have in my hand. (Shoe put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 4, half-round edge on double sole, E. H., spec'l exam'r.")

I find Complainants' Exhibit "Brown Patent Gear Cutter," on the side marked with a capital B, adapted and with an outline to trim a

half-round edge, such as shown on this shoe I have in my hand. (Shoe put in evidence and marked "Defendants' Exhibit Corthell Shoe No. 5, half-round edge, E. H., spec'l exam'r.")

Int. 3. In trimming these several exhibits did you or not employ with each of the cutters a smooth-edged disk known as a rand guide or guard, the same as is employed with other rotary cutters?

Ans. I did, with the exception of "Colt's armory cutter No. 3," with the two parts used together. I then used the guard the same as is used on the Corthell or the Orcutt cutter.

Int. 4. What, in your judgment, is the quality of the work performed by the cutters upon the edges of the five shoes introduced by you as exhibits, and how will it compare, in point of quality, with work performed by the cutters heretofore introduced as exhibits and marked Complainants' Exhibit Defendants' Cutter and Defendants' Exhibit Complainants' Cutter or similar cutters which are sold to the trade?

Ans. It is as good as the average on that class of shoes. Colt's armory cutter No. 3 and Complainants' Exhibit Brown Patent Gear Cutter trim just as nice an edge as any cutter sold for that purpose. Colt's armory cutters No. 2 and No. 4 have the outlines of their cutting edges all right, but do not cut as free as the other cutters.

Int. 5. Is there any difference in the manner of using or any more difficulty in using the several cutters with which you
488 trimmed the five shoes which you have introduced as exhibits than there is in using cutters made and sold by both complainants and defendants?

Ans. I can trim with them all as easy as I can with the cutters sold by complainants and defendants. Colt's armory cutters No. 2 and No. 4 I couldn't trim so rapid with; Colt's armory cutter No. 3 and Brown patent gear-cutter I couldn't trim so rapidly with. I could grind Colt's armory cutters No. 2 and No. 4 so they would trim so rapidly as complainants' and defendants' cutters.

Int. 6. Please examine the shoe now shown you, marked "Defendants' Exhibit Corthell Shoe No. 6," and state, if you know, by whom it was trimmed at the sole edge, and with what tool. (Shoe marked as stated put in evidence.)

Ans. It was trimmed by John B. Emery with the tool marked "Complainants' Exhibit Brown Patent Gear Cutter."

Int. 7. Please examine the thing now shown you, marked "Defendants' Exhibit Cutter, Corthell patent No. 207,395, Aug. 27, 1878," and state whether it correctly represents the cutter shown and described in said letters patent.

Ans. It does.

(Counsel for defendants here puts said cutter in evidence.)

SAMUEL N. CORTHELL.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of Benjamin H. Dorman.

BOSTON, *October* 17, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Please state your name, age, residence, and occupation.

Ans. Benjamin H. Dorman; 44; Lynn, Massachusetts; shoe manufacturer.

Int. 2. How long have you been engaged in shoe manufacturing and where is your place of business?

Ans. About eighteen years; Lynn, Massachusetts, 38 Exchange street.

Int. 3. Please examine the following-named exhibits filed by defendants in this suit, namely, Corthell Shoe No. 1, Corthell Shoe No. 2, Corthell Shoe No. 3, Corthell Shoe No. 4, Corthell Shoe No. 5, and the shoe marked "Defendants' Exhibit Corthell Shoe
489 No. 6," and state whether the finish of the edge of each represents a style of finish well known in the shoe trade.

Ans. It does.

(Defendants' counsel here puts in evidence the shoe referred to and marked "Defendants' Exhibit Corthell Shoe No. 6, E. H., sp'l ex'r.")

Int. 4. Please state whether or not the quality of the finish upon the sole edge of these several exhibits is good and workmanlike.

Ans. It is.

BENJAMIN H. DORMAN.

Attest: EUGENE HUMPHREY,
Special Examiner.

Deposition of John B. Emery.

BOSTON, *October* 12, 1882.

Direct examination by T. W. PORTER, Esq., of counsel for defendants:

Int. 1. Please state your name, age, residence, and occupation.

Ans. John B. Emery; 40; Lynn; edge-trimming machine operator.

Int. 2. How long have you been familiar with edge-trimming machines and trimming shoe soles therewith?

Ans. For sixteen months with an edge-trimmer.

Int. 3. Did you or not see Samuel N. Corthell trim the edges of the five shoes now shown you and marked Defendants' Exhibit Corthell Shoes Nos. 1, 2, 3, 4, 5?

Ans. I did see him trim them.

Int. 4. Have you seen shoes trimmed with cutters like the two now shown you and marked, respectively, Complainants' Exhibit Defendants' Cutter and Defendants' Exhibit Complainants' Cutter,

and are you familiar with the quality of work which these cutters will perform?

Ans. Yes, sir (to the first part of the question); I am (to the last part of the question).

Int. 5. How will the edge-trimming on the five Corthell Exhibit Shoes compare in quality with that done by cutters made similar to the exhibit cutters just shown you, but having an outline adapted to trim sole edges like the Corthell shoes?

Ans. I should say it was equally as good.

JOHN B. EMERY.

Attest: EUGENE HUMPHREY,
Special Examiner.

490 The following is the opinion of the court in accordance with which the bill of complaint in said cause was dismissed:

Before Gray and Colt, JJ.

Opinion of the Court. (*Sept.* 14, 1886.)

COLT, *J.:*

This suit is brought upon letters patent No. 238,303, issued March 1, 1881, to William D. Orcutt, one of the complainants, for improvements in rotary cutters for trimming the edges of boot and shoe soles. The invention relates to that class of rotary cutters consisting of a series of blades arranged about a common hub. The blades are described as having a flat front face, a flat rear face, and a top surface. Extending across the top surface there are a number of ridges, making a molded or fancy surface, which is the converse of the sole edge desired. The flat front faces of the blades are not radial, but are inclined so as to make each blade slightly hooked. This is said to be desirable for the purpose of cutting as distinguished from scraping the sole edge. The blades are ground on their front faces, and they are made quite thick so that they may be ground back as they become dull. The top surface of the
491 blades is slightly inclined, so as to give the necessary clearance in cutting. The first claim is as follows: "A rotary cutter for trimming sole edges, the blades *d* of which are provided with flat front faces *a*, and having their outer or peripheral ends *c* molded throughout to a uniform shape, the converse of the desired shape to be given to the sole edge and slightly eccentric to the axis of the cutter, substantially as described." The second claim gives more in detail the form of the front surface by referring to the ridges; otherwise it is much like the first.

The defendants do not deny the making of cutters which embody substantially the features specified in these claims, and therefore the question of infringement is not an issue in the case.

The first and main defence is that in view of the prior state of the art there was no invention in the Orcutt cutter. The history and development of this branch of mechanical art is fully set forth in the record before us. We do not deem it necessary to refer in

detail to the various prior patents and devices, because it seems to us that the question of invention in this case is comparatively simple and is to be determined by reference to two classes of prior tools, namely, the old hand tool or plane and the Brown gear-cutter patented in 1864.

If, as contended by the defendants, there is no substantial difference between the Orcutt cutter and the Brown gear-cutter except in the form or outline of the path or figure they cut, and if this form or outline in the Orcutt cutter was taken from the old hand plane, it is difficult to find any invention in what Orcutt did. A comparison between the Orcutt cutter and the various forms of the Brown milling-cutter before us discloses that, except as to the shape of the top surface of the blades, they are in all essential features the same; and in some instances even in this last respect there is a close resemblance. Turning now to the old hand plane for trim-
492 ming the edges of soles, used long prior to the date of the Orcutt patent, we find substantially the form of cutting teeth employed by Orcutt. The blade of the old hand tool had a rand lip, bead, bed guard, and channel guard, which are descriptive of the different parts of the surface of the blade, and the same features are found in the blade of the Orcutt cutter.

We are aware that Orcutt contends that his rand lip is, in fact, a rotary rand knife, different from the rand lip of the old hand plane, and to be used in connection with a rand guide, and made so thin that the lip and guide must go between the sole and the upper. Admitting this to be true, it is not sufficient to sustain the patent, because both the rotary rand knife and the rand guide are found in prior devices.

Upon careful consideration we are forced to the conclusion that the substance of Orcutt's improvement lies in the application of an old and well-known form of blade to a Brown milling-cutter for the purpose of trimming the edges of boot and shoe soles, and that this is merely a case of double use, and therefore not patentable.

Bill dismissed.

493 UNITED STATES OF AMERICA, }
Massachusetts District, } *ss*:

I, John G. Stetson, clerk of the circuit court of the United States for the first circuit and district of Massachusetts, certify that the foregoing is a true copy of the record of said circuit court in the cause in equity entitled Busell Trimmer Company *et al. v.* F. M. Stevens *et al.*, in said circuit court determined, and of all proceedings therein and of the opinion of the court therein.

Seal of the Circuit Court, Massachusetts.

In testimony whereof I hereunto set my hand and affix the seal of said circuit court, at Boston, in said district, this thirteenth day of June, in the year of our Lord one thousand eight hundred and eighty-seven, and of the Independence of the United States the one hundred and eleventh.

JOHN G. STETSON, *Clerk*.

494 (*Bond to Party on Appeal.*)

Know all men by these presents that we, The Busell Trimmer Company, a body corporate under the laws of the State of New Hampshire, having a place of business in Nashua, in said State, and a citizen of said State, and William D. Orcutt, of Boston, in the State of Massachusetts, as principals, and H. P. Knight and Chas. F. Johnson, as sureties, both of Boston aforesaid, are held and firmly bound unto Frank M. Stevens and Henry B. Cunningham, both of said Boston, and Samuel N. Corthell, of Quincy, in said State of Massachusetts, in the full and just sum of one thousand dollars, to be paid to the said Stevens, Cunningham, and Corthell, their certain attorney, executors, administrators, or assigns; to which payment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, by these presents.

Sealed with our seals and dated the 12th day of December, in the year of our Lord one thousand eight hundred and eighty-six.

Whereas lately at a circuit court of the United States for the district of Massachusetts in a suit in equity depending in said court between said Busell Trimmer Company and William D. Orcutt, complainants, and said Frank M. Stevens, Henry B. Cunningham, and Samuel N. Corthell, defendants, decree was rendered against the said complainants, and the said complainants having obtained an appeal to remove the said cause to the Supreme Court of the United States to reverse the decree in the aforesaid suit, and a citation, directed to the said defendants, citing and admonishing them to be and appear at a Supreme Court of the United States to be holden at Washington on the second Monday of October next:

Now, the condition of the above obligation is such that if the said complainants shall prosecute their said appeal to effect and answer all damages and costs if they fail to make their plea good, then the above obligation to be null and void; otherwise to remain in full force and virtue.

THE BUSELL TRIMMER CO., [L. S.]
By J. E. HORR, *Treasurer.*
WM. D. ORCUTT. [L. S.]
H. P. KNIGHT. [L. S.]
CHAS. F. JOHNSON. [L. S.]

Signed, sealed, and delivered in presence of—
J. S. HUTCHINS.

Witness:
J. DORR to H. P. K. & C. F. J.

Approved.
LE BARON B. COLT,
U. S. Circuit Judge.

A true copy of the bond taken by the judge at the time of allowing the appeal named in said bond, which bond is on file in the office of the clerk of the circuit court of the United States for the first circuit and district of Massachusetts.

Attest:

JOHN G. STETSON,
Clerk U. S. C. C., Mass. Dist.

Endorsed on cover: Massachusetts C. C. U. S. No. 363. The Busell Trimmer Company and William D. Orcutt, appellants, *vs.* Frank M. Stevens, Henry B. Cunningham, and Samuel N. Corthell. Filed August 4, 1887.

Office Supreme Court U. S.
FILED.
NOV 11 1890
JAMES. H. McKENNEY.
CLERK.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1890.

No. 71.

THE BUSELL TRIMMER COMPANY AND WILLIAM D. ORCUTT, APPELLANTS,

v.

FRANK M. STEVENS, HENRY B. CUNNINGHAM, AND SAMUEL N. CORTHELL.

APPELLANTS' BRIEF.

Supreme Court of the United States.

No. 71. October Term, 1890.

THE BUSELL TRIMMER COMPANY AND WILLIAM D. ORCUTT, Appellants,

vs.

FRANK M. STEVENS, HENRY B. CUNNINGHAM, AND SAMUEL N. CORTHELL.

The bill is based upon letters-patent No. 238,303, dated March 1, 1881, application filed Jan. 6, 1879, granted to William D. Orcutt for "Rotary Cutter for Trimming the Edges of Boot and Shoe Soles."

The title of the appellants to the letters-patent sued on is clear. The fact that the defendants have infringed is also clear.

The main defence is that in view of the state of the art no invention or discovery is described in the Orcutt patent.

A second defence is based upon the earlier patent to Orcutt, No. 212,971, dated March 4, 1879, application filed Jan. 6, 1879, for "Improvement in Rotary Cutters for Trimming Shoe-soles."

The bill was dismissed by the Circuit Court; their opinion is on pp. 363 and 364.

The errors assigned are: —

(1.) The Court decided that the application of an old and well-known form of blade (used in an old hand tool for trimming sole-edges), to a metal milling cutter (also old and well known), for the purpose of producing a rotary cutter for trimming sole-edges is a case of double use and not patentable;

and the appellants submit that this application is an invention or discovery of a high rank, and that it is patentable.

(2.) The Court decided that, in view of the state of the art, there is no invention in the Orcutt cutter; and the appellants submit that there is invention or discovery of a high rank in the Orcutt cutter.

(3.) The Court decided that, in view of two classes of prior tools (the Brown metal milling cutter and the old hand-plane), taken in connection with a third class of old devices in which both the rotary rand knife and the rand guide are found, the patent could not be sustained; and the appellants submit that the Orcutt cutter is an entirety, and substantially different in construction, mode of operation, and result, from the Brown metal milling cutters, and from the old hand-plane, and from all other devices known before Orcutt's invention; and they also submit that the rand lip or rand knife of the Orcutt cutter is radically unlike any prior rotary rand knife.

The Orcutt patent, No. 238,303, describes a rotary cutter for trimming sole-edges. The drawings show one form of the cutter, Figs. 2 and 3 being on a large scale, and Fig. 4 illustrating the cutter as used.

Each blade has:—

(1.) A flat front face *a*;

(2.) A flat rear face *b*;

(3.) A top surface *c*, which is a "moulded" or "fancy surface," with a ridge 1 at that side of the cutter, which, when in use, is next a rand guide; and one or more ridges 2 on the other side of the cutter. The top surface *c*, and flat front face *a*, are at such an angle as to form a rotary cutter rather than a scraper; and the top surface *c*, as well as the ridges 1, 2, 2, "are inclined rearward to give the necessary clearance:" that is, the curve of the top surface *c* is eccentric to the axis of the cutter; any radius through the cutting edge, formed by the intersection of the flat front face *a* and the top surface *c*, being longer than any corresponding radius through top surface *c*.

The cutter has a series of such blades; and the flat front faces are not radial, but are so inclined as to make each blade slightly hooking. The grinding is done only on the flat front faces *a*, which are maintained always at substantially the same pitch.

The claims are as follows: —

"1. A rotary cutter for trimming sole-edges, the blades *d* of which are provided with flat front faces *a*, and have their outer or peripheral ends *c* moulded throughout to a uniform shape, the converse of the desired shape to be given to the sole-edge, and slighty eccentric to the axis of the cutter, substantially as described.

2. "A rotary cutter for trimming sole-edges, the blades *d* of which are each provided with a flat front face *a*, and a slightly eccentric outer or peripheral end *c*, having formed thereon the end ridges, 1 and 2, extending circumferentially across said face, substantially as and for the purpose described."

These claims, taken in connection with the disclaimers (at the bottom of p. 238, and at the end of the description on p. 239), mean: —

First. The cutter as above explained, made up of blades having the ridge 1, or rand lip, and with or without "the ridges 2, 2, either or both."

Second. The cutter as above explained, made up of blades, with the ridge 1, or rand lip, and with the ridges 2, 2, or one of them.

That is to say, the two claims are for the same cutter, except that in the second claim "the ridges 2, 2, either or both," are essential in addition to the other essential features.

State of the Art.

Prior to Orcutt's invention (assuming it for the present to be an invention or discovery) there were three methods of trimming sole-edges: —

(1.) By the old hand-plane and by other trimming tools held in the hand.

(2.) By machines with rotary cutters.

(3.) By machines with non-rotary cutters.

Exhibits Snell & Atherton Cutter, and Snell & Atherton Cutter No. 2, show the old hand-plane, used many years ago, and superseded many years ago by hand-planes of which Exhibits Hand Plane, Hazard's Improved Dunham Edge Cutter, and Bigelow Cutter are examples.

All these hand-planes consist essentially of a "guard" or surface, which gauges the depth of cut. This term "guard"

happens to mean two totally distinct things as applied to hand-planes for trimming sole-edges. First, it means that part of the hand-plane which rests upon the sole-edge in advance of the cutting edge, as the plane is moved forward to trim the edge; this part has its surface the same as the outer surface of the blade of the hand-plane; and in the old hand-planes (Exhibits Snell & Atherton Cutter), where the blades may also be called teeth, the guard is like the teeth, except that the teeth have a cutting edge, and the guard has not. But on both the blade and guard of Exhibit Hand-plane, and on the guard (or blunt tooth), as well as on the cutting teeth of Exhibits Snell & Atherton Cutter, there is a ridge closely analogous to the ridge 1 of the Orcutt patent; and also other ridges closely analogous to the ridges 2, 2 of the Orcutt patent. The inner one of these inner ridges, marked 2, 2 in Orcutt's patent, is technically called the "guard," and the outer one the "channel guard" (often the "counter guard"; *i.e.*, "channel, guard" and "counter guard" mean the same thing). Technically, both the blade and the "guard" of Exhibit Hand-plane are made up of a "rand lip," the ridge 1 of Orcutt's patent, a "guard," the inner ridge 2 of Orcutt's patent, and a "channel guard," the outer ridge 2 of Orcutt's patent. That part of both blade and guard of Exhibit Hand-plane which is between the rand lip and "guard" in its other sense, that is, between ridge 1 and the inner ridge 2 of the Orcutt patent, is called the "bed." The little ridge at the junction of the rand lip and bed is called a "bead."

In the opinion of the Court, on page 364, it is said: "The blade of the old hand tool had a rand lip, bead, bed guard, and channel guard." It is likely that there is a comma omitted here, and that it should read "a rand lip, bead, bed, guard, and channel guard;" but the term "bed guard," although not used in the record, is a convenient term to distinguish between the guard proper (or the guage to regulate depth of cut essential in all forms of plane where the tool and the thing to be planed are pressed either towards the other); and that ridge, technically called the "guard," found on the blade as well as on the "guard" proper of the hand-planes, and on the teeth or blades of the Orcutt cutter. For this reason, the ridges 2, 2 of the

Orcutt patent may be called the " bed guard " and the " channel guard."

Hand-planes of the kind marked " Snell & Atherton Cutter," consisting of a number of cutting teeth, preceded by a single blunt tooth or guard proper, each tooth having a rand lip and bed; or a rand lip, bed, and bed guard; or a rand lip, bead, bed, bed guard, and channel guard were well known years ago; and so were hand-planes of the kind marke d " Hand-plane," and " Hazard's Improved Dunham Edge Cutter."

Rotary cutters for trimming sole-edges were also well known years ago. The earliest were what are called " burr " cutters; disks or cylinders of metal with saw teeth or ratchet teeth. These burr cutters had a bed only, and lacked the rand lip, bead, bed guard, and channel guard. They were used up to 1874 or 1875, but their use was limited to a cheap, inferior grade of boots and shoes; the better grades being all trimmed with *hand-planes*, at first with the old hand-planes (Exhibits Snell & Atherton Cutter), and afterwards with the improved hand-planes (Exhibits Hand-planes and Bigelow Cutter).

In the Tayman patent, No. 136,790, of 1872, a rotary cutter is described composed of three burr cutters, two thin disks of steel of the same diameter, and a third disk of larger diameter, like a bevelled gear, but with triangular teeth; all three held close together on the same shaft, and used with a rand guide, as burr cutters were, of course always used, to prevent injury to the upper leather.

This tool of Tayman's is the first rotary tool with a rand lip, or rand knife, and a bed; and, as such, it is important in this case.

It did not give satisfaction, and was not widely used. Its importance here is simply that it shows that Tayman *attempted* to make a rotary cutter for trimming sole-edges, with a rand lip and bed; and how he attacked that problem. He, in fact, failed to achieve any large success, and resorted to a totally different plan of trimming sole-edges; that is, with non-rotary blades, the blades and the shoe being both controlled by highly ingenious and complex mechanisms, as will be referred to below.

Next, after Tayman's attempt to make a rotary sole-edge cutter with a rand lip and bed, came a number of attempts to

make what may be best defined as composite cutters; that is, the rand knife or rand knives were separate blades, working with, but not integral with, the bed cutter. One example of these attempts is shown by Exhibit Thompson Rand and Sole Trimmer.

These composite cutters and Tayman's three disk cutter seem to be conclusive proof (1) that the demand for a rotary cutter with a rand lip, bed and bed guard, was well recognized before and at the time of Orcutt's invention in 1878 or 1879, and (2) that no one, before Orcutt, could make a cutter to supply that demand.

The burr cutters were supplanted by cutters which were capable of being readily sharpened by grinding on the top surface of the blades or teeth; of which Exhibit Old Busell Cutter is an example; and cutters of this character were used in this art to the practical exclusion of all other rotary cutters, after 1874, and until they were in turn supplanted by the cutter of the Orcutt patent in suit, which is commonly called the Busell cutter, because put into use by the Busell Trimmer Company.

In addition to the attempts of Tayman and the makers of other composite cutters to produce a practical cutter to supersede the hand-plane, Mr. Samuel N. Corthell, one of the defendants, and an expert of the experts, made the same attempt about 1878; and he produced a cutter, each tooth of which had a flat top, and a moulded front face; the rand lip, bead, bed, and bed guard, being on the front face, as shown in Exhibits Cutter Corthell Patent, No. 207,395; and Corthell Patent Cutter (patent No. 207,395).

Besides the hand tools and the rotary cutters for trimming sole-edges, many inventors attempted to make sole-edge trimming machines in which the blade was held and controlled by a highly complex mechanism, while the shoe was held and controlled by a second mechanism equally complex.

What has been said as to the state of the art is a brief abstract of the testimony of Coleman and Noble (pp. 18 *et seq.* and 122 to 132).

IT IS A WEIGHTY FACT that there is nothing whatever in the state of the art of sole-edge trimming, or in the analogous art of sole-edge burnishing, which affords any defence to this suit.

For although rotary burnishing tools of all styles of rand lip, bead, bed, bed guard, and channel guard had been common for years before Orcutt's cutter was produced, yet it cannot be disputed that there is nothing whatever in the state of the art tending to show that Orcutt was not the first to produce a rotary cutter with a number of teeth or blades each having a rand lip and bed (or a rand lip, bed, and bed guard; or a rand lip, bead, and bed guard; and *all* modern rotary cutters for sole-edge trimming fall under the main class distinguished by the presence of both rand lip and bed), each with a flat, front face; and each blade serving as a guard for the succeeding one.

This is believed to be the hinge of the case; and in order to give it fit emphasis, and in particular to force it upon the attention of the learned counsel for the appellees, it is again asserted that there is nothing whatever in the state of art of trimming or of burnishing sole-edges tending to show any rotary cutter prior to Orcutt's made up of—

A NUMBER OF BLADES, EACH HAVING A RAND LIP AND BED (or a bead, or bed guard, or channel guard in connection with a rand lip and bed), EACH WITH A FLAT FRONT FACE; AND EACH BLADE THE GUARD FOR THE CUTTING EDGE OF THE SUCCEEDING BLADE.

In another art, however, the art of milling metals, a rotary cutter has been well-known since 1864, which bears a close resemblance to Orcutt's sole-edge cutter; and those metal milling cutters were of a large variety of styles, and were in general and common use for upwards of ten years before 1878, the date of Orcutt's invention. They are known as Brown & Sharpe metal cutters, and are made up of a number of blades, each having a flat front face, and a moulded top surface, the converse of the surface to be milled; and moreover each tooth has the proper clearance, so that, if one of the Brown & Sharpe metal cutters, and one of the Orcutt cutters be compared, *when not in use*, say, one held in the left hand, the other in the right, there is a marked likeness between them; in fact, no substantial difference, except that one lacks and the other has a rand lip, bed, etc.

Indeed, several styles of the Brown & Sharpe metal cutters have a ridge which closely resembles the ridge 1 of Orcutt's

patent, and other ridges which may be likened to the ridges 2, 2 of Orcutt's patent. But it is nevertheless certain that no rotary cutter was made prior to Orcutt's in which the ridge 1 and the ridge 2, 2, or either of them, were made according to the rules governing the making of the blades or guards of the hand-planes. The "style" of a sole-edge depends upon the slant and height of the rand lip (or ridge 1 of Orcutt's patent) and of the bed guard (and channel guard when one is used); and in some "styles" there are many varieties, different widths of bed with or without beads. (Last paragraph on p. 127 and first and second on p. 128.)

The flat side of the rand lip of the Orcutt cutter must also fit the rand guide (see Fig. 4 of the Orcutt patent), and this is not a requirement of the Brown & Sharpe metal cutters, nor of the blades of the old hand-planes (Exhibits Snell & Atherton Cutters), nor of the modern hand-plane, (Exhibit Hand-plane), although it was a requirement of the blade of the Bigelow cutter, which blade was part of a ring.

In use, the Brown & Sharpe metal cutters act upon the metal clamped upon a rigid bed; and the distance between the axis of the cutter and the surface of the bed is fixed; that is, the cutter is not pressed towards the bed, nor the bed towards the cutter; hence the top surface of one blade or tooth performs no function as a guard; and this is relied upon by the appellants as a substantial difference; and one showing invention in the Orcutt sole-edge cutters.

One piece of vulcanized rubber is the same as another piece of vulcanized rubber, although the first be vulcanized about teeth, and the second about something else. But the fact that a dental plate of vulcanized rubber will give a moisture-tight joint made Cummings dental plate an invention of a high order.

Smith *v.* Goodyear Co., 93 U.S., 486.

One piece of wire covered with gutta-percha is obviously the same thing as another piece of wire covered with gutta-percha; but when one is in use as a conductor of electricity and the other a wire protected from the weather, they are obviously substantially different inventions.

Colgate *v.* W. U. T. Co., 15 Blatchf., 365.

A machine for making dough pipe or maccaroni, or for making clay pipe, closely resembles a machine for making lead pipe; but the latter is a great invention for all that.

Lead Pipe Cases, 14 How., 156; 22 How., 132.

Two machines for cleaning grain, alike in all respects, except that the screens have an endwise shake in one, but a sidewise shake in the other, are different inventions, if the sidewise shake is a vital feature.

Parks *v.* Booth, 102 (12 Otto) U.S., 96.

There is no doubt that Orcutt is the first to produce a rotary cutter, each blade of which has a flat front face in connection with a top surface, having the rand lip and bed of the hand-plane; the top surface of each blade being the guard for the succeeding blade. The appellees may urge that the first assertion is a verbal difference, as both the metal cutters and the Orcutt cutters have a moulded surface, the converse of the surface to be formed by the cutter; and that the second assertion is as true of one cutter as of the other, *if both be used in the same way.* The facts remain, however, that Orcutt is the first to form the blades of a rotary cutter according to the rules governing the making of a blade with rand lip and bed, or rand lip, bead, bed, and bed guard; and also that Orcutt is the first to so use such a cutter that the top of each blade acts as a guard.

A *guard* for each cutting edge is essential in a *plane;* thus, the old hand-plane (Exhibits Snell & Atherton Cutters) has the front tooth blunt, and that tooth is the guard for the second tooth or blade; the second is the guard for the third, and so on. The Exhibits Hand Plane and Bigelow cutter have but one blade, and consequently one guard. In the Orcutt cutter each blade is the guard for the succeeding blade. But in the Brown & Sharpe metal cutter, when used for milling metal, *there is no guard*, nor any use for any. *The Brown & Sharpe metal cutter is* not *a plane;* and never can be a plane when used on metals. After Orcutt's invention, it is easily seen that the top surface of each blade of a Brown & Sharp metal cutter will act as a guard *if* the work be pressed towards the cutter; but the fact is that this top surface never did so

act when the Brown & Sharp metal cutter was used, and never will so act when that cutter is used for milling metals.

The surface of the guard must, of course, be like the cutting edge, and ORCUTT'S IS THE FIRST ROTARY PLANE WITH A NUMBER OF MOULDED CUTTING EDGES AND A MOULDED GUARD FOR EACH.

The old hand plane had a number of moulded cutting edges, and a moulded guard for each; but was not rotary, and its front tooth was not a blade, but a guard only.

These two facts (1) that Orcutt's cutter is the first rotary cutter with a rand, lip and bed, or a bead, bed guard and channel guard; (2) that it is the first rotary plane with a moulded cutting edge; that is, that it has a moulded guard for each moulded cutting edge; make it an article of very great value to the community; enabled it to supersede the hand plane, all other rotary sole-edge cutters, and all other kinds of sole-edge trimming machines; and these facts tend strongly to show that it is an invention of a high order.

This question of invention is considered with absolute frankness, and it is submitted with much clearness by the experts, Mr. John A. Coleman (pp. 18, *et seq.*) Mr. Frederick W. Coy (pp. 89, *et seq.*) and Mr. O. L. Noble (pp. 122, *et seq*).

Mr. Coy's testimony is noticeable because of the curious fact that he was employed in 1878 or 1879 to investigate the possibility of sole-edge trimming with rotary tools, and reported that rotary cutters, as then known, were incapable of doing good work; also because Mr. Coy spent much time in an effort to perfect a machine using a non-rotary blade, and ceased work on it because he became convinced that it could not compete with the Orcutt cutter; and lastly, because Mr. Coy himself used a number of the Brown & Sharpe metal cutters in manufacturing his machine for trimming sole edges; and it never ocurred to him that such cutters could be used for sole-edge trimming, or be so modified as to make sole-edge cutters.

It is clear that Orcutt has given a consideration for his patent far greater than is given by the great majority of patentees. He has taught the makers of boots and shoes a fact as important in their art as the fact that Simpson taught electricians, or Cummings the dentists, or the Hansons lead pipe makers; or

as any ever taught by any inventor, except the very few in the highest ranks.

Had Brown & Sharpe cutters been known before Orcutt's invention, in all respects precisely the same as Orcutt's, but used only in metal milling; that is, revolving slowly without a rand-guide, and milling metal clamped upon a bed, sliding in stationary ways; and had Orcutt conceived the notion that such cutters might be used with a rand-guide on sole-edges, if revolving very rapidly and with the shoe held in the hand, and on trial found that he was right; the question as to his right to a patent would have been a pure question as to double use, and much the same question as in the case of Colgate *v* W.U. Co. Cross-ints. 147 and 148, p. 61.

The appellants deny that Orcutt's invention is the case of "the application of an old machine," the Brown & Sharpe cutter, "to a similar or analogous subject, with no change in the manner of application, and no result substantially different in its nature."

Railroad Co. *v.* Safety Trust Co., 110 U.S., 493.

The fact is clear from the testimony above cited that the teeth or blades of Orcutt's cutter must be made hooking; the angle between the front face and top surface more acute; and the clearance or reduction of length of radii different from the like features in the Brown & Sharpe cutter; that is to say, while an Orcutt cutter will mill metal if used in a metal milling machine without a rand guide, and a Brown & Sharpe cutter will trim leather if used in a sole-edge machine *with a rand guide*, yet each will be a defective tool when so used. But the facts remain that no Brown & Sharpe cutter, nor any other cutter, prior to Orcutt's, had blades with a rand lip and bed, and a flat front face, the moulded top surface of each blade being the guard for the next blade.

Assuming that Orcutt made an invention, it is well settled law that it cannot be anticipated "by proving that a part of the entire invention is found in one prior patent printed publication or machine, and another part in another, and so on indefinitely." Parks *v.* Booth, 102 U.S., 103. Moreover, the old hand plane was not a rotary cutter; its rand lip was not adapted for use with a rand guide, and it had one blunt tooth which was a guard

merely; and while it had a guard and blades, each of which had a rand lip and bed, and also a bed, bed guard and channel guard, yet it manifestly is not Orcutt's cutter. The Brown & Sharpe cutters in truth lack the rand lip and bed, and all the special sole-edge trimming features; and although it be true that the moulded top surfaces of their blades will act as guards, *if* the Brown & Sharpe cutters be used in a sole-edge trimming machine; yet it is certain that they never did so act, never were intended to so act, and that the sole reason why it is now known that they will so act is because of Orcutt's invention. As to the third class of devices referred to in the opinion of the Circuit Court, it is certain that while rotary rand knives and rand guides were well known long before Orcutt's invention, yet there is no evidence tending to show that a rotary rand knife integral with the bed was ever known, or used with a rand guide, except in Orcutt's cutter.

As to the defence that Orcutt's patent in suit is void because of his patent No. 212,971, it is clear that the cutter shown in the latter patent is that shown in the patent in suit; but both were applied for on the same day, Jan. 6, 1879. The fact that the specification and claims of the patent in suit were amended in substance after the grant of patent No. 212,971, is no defence to this suit.

Before the act of 1870 it is possible that an amendment as to substance required a new oath; but that requirement was omitted in 1870, and the law did not require a new oath.

Section 4903 is as follows: —

"Whenever, on examination, any claim for a patent is rejected, the Commissioner shall notify the applicant thereof, giving him briefly the reasons for such rejection, together with such information and references as may be useful in judging of the propriety of renewing his application or of altering his specification; and if, after receiving such notice, the applicant persists in his claim for a patent, with or without altering his specifications, the Commissioners shall order a reëxamination of his case."

There is now no limitation as to amendment, except that he is not to incorporate anything invented subsequently; nor anything which has gone into use, so that an equity has risen up against him. But there is not a suggestion here that these de-

fendants, or anyone else, adopted this invention until some time after the patent in suit was issued, or spent a dollar, or did anything whatever in relation to this invention until some time after the date of the patent in suit.

It was perfectly proper, therefore, for Orcutt to amend after rejection of his application, and to base his amendment upon the thing he carried into the Patent Office. Not that he is to make the same claim substantially as that first made; for the Patent Office refuse to give him a patent for that. He acquiesces in that rejection, looks upon the thing he has carried into the office, and amends to claim what he can find in it that is his invention; and, unless he is precluded by laches in some way, he is entitled to make that new claim; and the Commissioner of Patents has so adjudicated. He is not supposed to go to the Patent Office with all the information and all the knowledge which the world has in respect to the thing he describes in his specification and drawings; and it is one of the most important functions of the Patent Office to give him "such information and references as may be useful [to him] in judging of the propriety of . . . altering his specification."

The Patent Office decided that the invention as at first claimed was old, but gave him an opportunity to see what else there was which he was entitled to claim; and that is what the law says.

It may be urged that there was a rule of the Patent Office requiring a new oath from Orcutt. However that may be, the fact is that the Commissioner of Patents did not require a new oath from Orcutt, and it must be presumed that the Commissioner did not see fit to enforce the rule, if there was one, against Orcutt.

It can not affect the rights of Orcutt, and the vested property rights of his assignees, when he had satisfied the requirements of the statute, that the Commissioner had established some rule which the Commissioner did not see fit to enforce against Orcutt, and which the Commissioner would not have had a right to enforce against Orcutt if there was anything in the law that conflicted with the rule.

Respectfully submitted by

J. E. MAYNADIER,

of counsel for appellants.

FILED.
NOV 11 1890
JAMES. H. McKENNEY.
CLERK.

Supreme Court of the United States.

No. 363.

IN EQUITY.

THE BUSELL TRIMMER COMPANY AND WILLIAM D. ORCUTT, APPELLANTS,

vs.

FRANK M. STEVENS, HENRY B. CUNNINGHAM, AND SAMUEL N. CORTHELL.

APPELLEES' BRIEF.

T. W. PORTER,
Of Counsel.

BOSTON:
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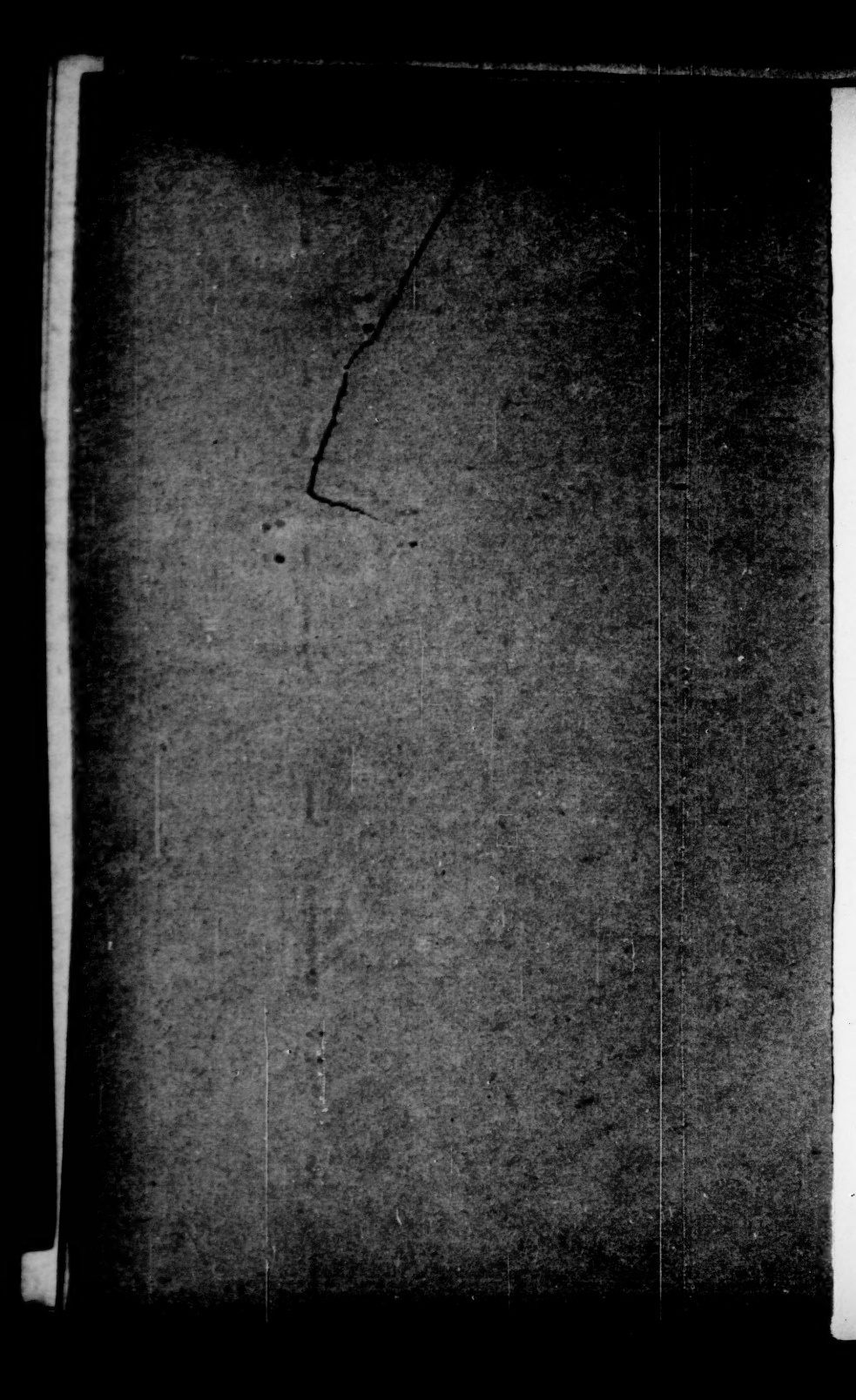

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Supreme Court of the United States.

THE BUSELL TRIMMER COMPANY AND WILLIAM D. ORCUTT, APPELLANTS, *v.* FRANK M. STEVENS, HENRY B. CUNNINGHAM, AND SAMUEL N. CORTHELL, APPELLEES.

No. 363.

APPELLEES' BRIEF.

This suit is brought upon United States patent No. 238,303, issued March 1, 1881, to William D. Orcutt, one of the appellants, for an alleged improvement in rotary cutters for trimming the edges of boot and shoe soles. The question of infringement is not in issue, as it is not denied that appellants make and vend cutters that embody the features specified in the patent in suit.

BRIEF STATEMENT OF DEFENCE.

Appellees rely upon the following grounds of defence: —

First. In view of the state of the art, both in sole-edge trimming and in rotary cutters, at the date of Orcutt's alleged invention, a valid patent could not have been granted, conferring a monopoly of the subject matter embraced in the claims in the patent in suit.

Second. Orcutt was not the first inventor of what is claimed in the patent in suit; he has never sworn that he was; but on the contrary, he swore that he had made an invention so entirely different that both the original drawing and specification had to be abandoned, and a new drawing and specification substituted, before the invention now covered by the patent could be claimed. And the invention (so called) was first made by F. M. Stevens, one of the defendants in this suit, who did not attempt to patent it, because

he did not believe it was patentable; as fully appears by the testimony in the case.

Third. Orcutt never applied for a patent substantially or colorably like that on which this suit is brought, and he never made oath that he was the inventor of what is claimed in said patent. This is fully proved by the file wrapper and contents in evidence in the suit; and such fact is, by the official record of the Patent Office, before the court as a matter of legitimate defence.

Fourth. If Orcutt's alleged invention had been such as to entitle him to a valid patent therefor (assuming, in this proposition, that he was the first inventor thereof), then the invention is dedicated and forfeited to the public, for the following reasons: On Jan. 6, 1879, he applied for two patents on rotary cutters; in one he claimed the method of producing clearance, by bending back the teeth, after their peripheral face has been moulded, — and upon this application, patent No. 212,971 was issued March 4, 1879; this patent showing fully everything that is claimed in the patent in suit. In the other application, when filed, Orcutt did not claim what now constitutes the subject matter in suit; nor did he make any claim therefor, till Jan. 4, 1881, almost two years after the issuing of the earlier patent. Hence, by the issue of the first patent, showing all that is now claimed in the patent in suit, and as the same was not claimed till long after the issue of the first patent, such subject matter was thereby dedicated to the public, and the right to a patent thereby forfeited, and hence could not lawfully be subsequently claimed in another patent, as is attempted in the patent in in suit.

BRIEF STATEMENT OF APPELLEES' EARLY ATTEMPTS TO ESTABLISH A MONOPOLY IN BOOT AND SHOE SOLE TRIMMING.

As the appellees have heretofore laid much stress upon the extensive use of their cutter, and its having to a certain extent superseded some other trimming cutters, it may be proper before proceeding to consider the testimony upon

which defendants rely for the maintenance of the foregoing propositions, to briefly refer to the previous history of this controversy, as showing the course pursued by the complainants in their attempts to establish a monopoly of the art of trimming boot and shoe soles with rotary cutters. As a short method of arriving at the facts connected with this phase of the question, attention is called to the testimony of Milton L. Eddy (pp. 173, 174, printed record), which shows that, in 1880, Eddy's firm were making and selling rotary trimming machines and cutters; that those cutters "*were the same in all substantial respects as that shown in the Orcutt patent*," now in suit; that on Aug. 28, 1880, this company brought a suit at law on eight patents, one of which was the Tayman reissue No. 9,073, against Eddy & Co., attaching all their property, including stock in trade, tools and machinery; which attachment was dissolved by bond. That on Dec. 30, 1880, this company brought a suit in equity, on said Tayman reissue, against George E. Keith, a shoe manufacturer, for using these same cutters bought of Eddy & Co.; and in January, 1881, they brought a suit against F. E. White, another shoe manufacturer and a customer of Eddy & Co., for using these identical cutters.

Both these latter suits were assumed and defended by Eddy & Co.; and that against Keith was heard on motion for a preliminary injunction, which was denied. It is to be borne in mind that these suits were brought anterior to the allowance even of the Orcutt patent, and that complainants were then, as Eddy states, "*sparing no pains and seemingly leaving no means untried to bulldoze the public, interested in that class of machinery into the theory and belief that said Tayman reissue patent controlled the right to make and use cutters like the Orcutt cutter.*" It further appears that the Corthell Company (a corporation) acquired the Corthell patent of Eddy & Co., and their cutter business; and then the Busell Company brought suit against it on the present Orcutt patent; and that suit proceeded in due course to the completion of defendants' testimony; "*but*," as Eddy significantly says, "*the complainant never took rebutting testimony, but instead,*

commenced to break up the business of the Corthell Company by offering and paying higher wages to their skilled cutter makers and salesman (the present defendants, Stevens and Corthell) than they were receiving, and finally by such means forced that company into a compromise and consolidation, with a settlement of said suit at law (against Eddy), and two suits in equity (Keith and White), then pending on the Tayman patent, and the suit at law against Stevens et. al., *and the said equity suit against the Corthell Company on the Orcutt patent, as also an agreement not to prosecute any customers of any of said defendants who had used said cutters.*" The witness adds that "*this compromise was an inequitable, unjust and unfair transaction brought about by the sharp practice of the Busell Company's manager, in tampering and meddling with the affairs and workmen and employees of the Corthell Company; and it was only acquiesced in finally, as a bitter alternative, by reason of the superior financial ability of the Busell Company, who threatened to hire off any help that the Corthell Company might employ: and also to so reduce the price of cutters as to leave no profit thereon.*" Eddy also testified that "*one of the reasons urged in private by the Busell Company's manager for the compromise, was that to try the suit on the Orcutt patent would be to make that patent public property; and they freely admitted that the evidence taken would destroy the patent, as it showed that the patent possessed no patentable novelty whatever.*"

The same facts in relation to Noble's statements of his reasons for urging a settlement and compromise are testified to by Cunningham, one of the present defendants, who states (on p. 209, printed record), as follows: "*And I was present when O. L. Noble was urging our firm, late in* 1882, *to quit making rotary cutters for the Corthell Company, and contract to make cutters for the Busell Company, of which Noble was then, as now, superintendent; and in addition to increased compensation promised us by him, he strongly urged that our leaving the Corthell Company would force them to compromise the suit then pending between said companies on the Orcutt patent, and lead to a consolidation of the*

two companies, which he urged was the best course, because (as he often stated) the trial of that suit would make the Orcutt cutter public property."

Stevens, another of the defendants, testifies as follows in relation to Noble's statements (p. 166, printed record) :—

"*While I was, in* 1882, *making cutters for said Corthell Company, Oscar L. Noble came to me and wished me to leave said Corthell Company and engage to make cutters and other shoe machinery for the Busell Trimmer Company; and, as one of the reasons for my so doing, he urged that he knew, as did Samuel N. Corthell, then present, that any one had the legal right to make cutters, such as were then involved in the suit pending between said companies, and called the Orcutt cutter; and that he wished to employ me and said Corthell in order to force the Corthell Company into a compromise.*"

Noble, complainants' general manager, contradicts the testimony of Stevens, Cunningham, and Eddy, in relation to his expressed reasons for his various measures for coercing the Corthell Company into a compromising consolidation, but admits the means he used; and he gives the following consistent theory for his attempts at compromise (p. 270, printed record) : "*After that testimony was taken (the Corthell Company's evidence in defence), the Busell Company felt themselves strong enough to dictate the terms of settlement, especially after Stevens & Co. deserted the Corthell Company, and became employees of the Busell Company, which is what I understand Mr. Eddy to say, in substance, although he speaks with much bitterness against the Busell Company.*" The special reason above assigned, which Noble characterizes as the *desertion* of Stevens & Co., after he himself had designedly employed them, is of a very refreshing character; while the general reason, that the Busell Company was strengthened by the Corthell Company's testimony, is a repetition of the exploit of John Phœnix in his pugilistic encounter with the big bully whom Phœnix held down by means of his nose, which he had ingeniously inserted between the teeth of the bully for that especial purpose. These explanations of Noble are of a piece with that

given by him for bringing the suit at law against these defendants in 1884, and attaching their entire property for infringing this patent, and then not entering the suit (Stevens, p. 167; Cunningham, p. 210), when, as these witnesses both testify, Noble stated that "*he would resort to every mean, dirty trick that he could to break up their business*," the bringing of which suit Noble explains (p. 269) by saying that "*this suit was brought because I believed that Stevens would see that they had made a blunder, and would desist from their infringements; but, on finding that they would not, I was advised that the only course open to us was to abandon the suit at law and file a bill of complaint for an injunction.*" Thus the suit at law was a mere pleasurable effort at "*moral suasion*," after which Noble was "*advised*" to bring the present suit, in which he sought a preliminary injunction and failed. It may be further observed that the testimony of Stevens and Cunningham clearly shows that (though contradicted by Noble, of course) their proceeding to manufacture cutters, for which this suit is brought, arose from the gross violation by Noble of the contract under which he hired them from the Corthell Company, and their acting upon his declared opinions, expressed in connection with that hiring, of the invalidity of the Orcutt patent.

The foregoing reference to and extracts from the testimony is for a threefold purpose: first, it shows both the strategy and tactics of the complainants in their endeavor to "*corner*" the art of trimming soles with rotary cutters; second, it displays the agility and aptitude of complainants' manager, Mr. Noble, in instituting suits to frighten competitors, as also in coercing compromises of such suits, when he deems it desirable; and it shows his readiness to attempt, by his own unsupported testimony, to discredit *three* witnesses, one of whom is disinterested, and the other two have no interest, in fact, different from that of Noble; and, third, this testimony has an important bearing upon the question of the validity of Orcutt's patent, as will be hereinafter pointed out.

In presenting the evidence upon the first ground of defence,

which is, in substance, that there was no patentable invention made, it is indispensable that the testimony be subdivided under various heads, by reason of the kaleidoscopic theories adduced by complainants in the course of their testimony in support of the theory that the cutter in controversy embodies patentable novelty when tested by the state of the art at the date of its alleged invention.

COMPLAINANTS' CHANGE OF FRONT IN PRESENT SUIT, AS SHOWN BY ORCUTT'S OWN TESTIMONY GIVEN IN SUIT *v.* CORTHELL COMPANY.

That complainants have entirely and repeatedly "*changed fronts*" in their theories as to what constituted and established patentable novelty in Orcutt's cutter, is clearly shown by a general comparison of the testimony taken by them in the former Corthell suit, so called, No. 1,673 (the record whereof is in evidence by stipulation in this suit), with that taken by them in the suit now pending.

Orcutt, the inventor and patentee of complainants' cutter, when testifying in his own behalf, and asked by his counsel, "*Did it ever occur to you that that cutter (Exhibit Brown Patent Gear Cutter) — patented in 1864 — was substantially the same thing as that shown in your patent, Exhibit Complainants' Patent?*" answered, "*Yes, the main features of this are the same as the Orcutt*" (see printed record, p. 299, Int. 5); and when further questioned by his counsel in a manner directly leading, "*What are the substantial differences between the two, in your opinion?*" Orcutt replied, "*Well, this cutter (Brown Patent Gear Cutter) differs from mine from the fact that this was made for milling iron, and mine was made for trimming the edges of boot and shoe soles*" (printed record, Int. 6, ibid); while in the next answer, the seventh, the ridges 1 and 2 in Orcutt's cutter are stated to be specific differences between Exhibit Brown Patent Gear Cutter and Orcutt's. In answer to Cross-Ints. 30–32, p. 302, printed record, Orcutt stated, that with the exception of a difference in diameter, complainants' Exhibit Brown and Sharp Milling Cutter

No. 1 was "*equally as well adapted to trim the edge of the shoe sole as is the cutter shown in complainants' patent, provided its outline or the configuration of the path that it will cut was preferred by the user to that shown in complainant patent*"; thus showing that the only difference between this cutter and that of Brown and Sharp's milling cutters was in the configuration of the peripheral face; for diameters of cutters are "*legion*" in their diversity of measurement. And in answer to Cross-Int. 36, same record, Orcutt again states that the ridges 1 and 2 constitute the difference between his cutter and the Exhibit Brown and Sharp Milling Cutter No. 1. While in answer to Cross-Int. 41, Orcutt states that there is no difference between his cutter and the Brown patent gear cutter, except that his is adapted to trim sole edges and Brown's would spoil them. And in Cross-Ints. 42, 44, Orcutt admits that a milling cutter, shaped to cut an outline like Fig. 4 in his patent drawing, but having a thicker rand lip, would, with the exception of such thickened lip, be "*equally well adapted to trimming the edges of shoe soles as for trimming metal.*"

It is true that in answer to Cross-Ints. 45–49, Orcutt claims that the slots between the teeth are deeper in his cutter than in the Brown and Sharp cutter, but he admits there is nothing in reference to it in his patent; and further, that defendants' cutter is grooved differently, and hence, if, as claimed, defendants' cutters are in all material respects like Orcutt's, then such depth of slot is immaterial; and the more so as the patent in suit is silent on the subject, while Orcutt's patent of 1879 shows this exact feature. Hence it is clear from Orcutt's own testimony, above quoted and referred to, that he himself claimed no novelty in his cutter, except an old and well-known peripheral configuration, placed upon a cutter which in all other respects was simply Brown's patent cutter, of 1864.

And Noble, the manager and head and front of the complainant company, in his testimony in the Corthell record, fully corroborates all that Orcutt stated. See his answer to Ints. 20, 21, and 22, printed record, p. 295; while in answer

to Cross-Int. 28, same record, he testified that Brown's cutter had the same flat front face *a*, and outer eccentric peripheral end *c*, as shown in the drawings in Orcutt's patent. He further admits, in answer to Cross-Int. 29, same record, that there is the same facility for sharpening by grinding, and in the same way as in Orcutt's cutter. And in answer to Cross-Int. 39, same record, Noble states that the capability of Orcutt's cutter to produce varieties of styles of sole edges, results from no cause other than is shown in Brown's patent gear cutter, except that it is formed to take out the welt, trim the edge and bevel the bottom of the sole; that is, that its only novelty was in its peripheral configuration. And in answer to Cross-Ints. 41 and 42, same record, Noble states that there "*is not any difference between the Orcutt cutter and the Brown patent gear cutter, except the form or outline of the path or figure which they will cut.*" The testimony of these most interested witnesses is direct and positive that Orcutt's alleged invention consisted in nothing but the mere forming of Brown's patent cutter, with a peripheral face like the old hand plane, or with a form to produce a moulded edge on the sole, as Orcutt says in answer to Cross-Int. 43, p. 303, printed record; which form of sole edge he there states to have been then old.

But when testimony was to be taken in the present suit, an absolute change of base was made by complainants, and evidence from an entirely new source and of an entirely new character, was by them invoked. This change in the whole theory of complainants' case is shown in the seven direct interrogatories to John A. Coleman and his answers thereto (pp. 16 to 28), in which are set up theories and pretences by the dozen, to prove that Orcutt's cutter is in numerous respects unlike that shown in Brown's patent. As Coleman was introduced with the evident purpose of evolving a new prosecuting theory, and swearing the same through, and as in his seven direct answers he evolved, or rather repeated after complainants' attorney, all the newly developed theories of the case, it became necessary, especially in view of his unwillingness, in cross-examination, to answer many test

questions, as also his inclination to declaim in general terms upon Orcutt's alleged invention, to subject him to extended cross-examination, during which almost every theory which he had advanced was retracted.

As it is a favorite and frequent practice, to attempt to win patent causes upon theories, rather than facts, and as in this case the facts disprove each and all of complainant's theories, the testimony will be marshalled by defendant to meet each pretence set up to sustain complainants' patent.

FIRST SPECIFICATION OF FIRST DEFENCE. AT DATE OF COMPLAINANT'S ALLEGED INVENTION, CUTTERS FOR SAME PURPOSE, WITH TEETH EXACTLY THE SAME, WERE OLD, COMMON, AND WELL KNOWN.

The first specification of the first defence, the state of the art, is that, at the date of Orcutt's alleged invention, cutters for the same identical purpose, and with teeth exactly like those in his cutters, were old, common, and well known. See Noble, printed record, p. 126, where in speaking of the names of the parts of the teeth in Orcutt's cutter, says: "*These terms are all taken from the old hand plane, marked 'Exhibit Hand Plane,' and on same page, in comparing Orcutt's cutter with a hand plane, says, there must obviously be the same rules as to proportions of the lip, bed, and guard, and also as to the bead and channel guard, when used, applied to the rotary cutter, as are applied to the hand plane.*" And on same page Noble further says, in speaking of the teeth of the hand plane, "*and if a series of these planes were arranged around a common axis, a rotary cutter substantially the same as the cutter of the patent in suit would result.*"

Corthell, Int. 23, p. 315, printed record, says, there is no difference between the operations of Orcutt's cutter and the Dunham edge cutter, except that one moves in a rotary and other in a reciprocating path. In the next answer, Corthell states that the Exhibit Snell and Atherton Cutter is the same as Orcutt's with the exception last stated, and that the ex-

hibit had no sunken channel, which was old and well known before 1872. Andrén, an expert called by defendants, says in Cross-Ints. 49, 50, 51, pp. 196–7, printed record, that the earlier Bigelow Exhibit Patent Cutter is identical with Orcutt's, except that one cuts slow and slices the material, and the other cuts fast and powders it; and that these differences are not material, because "*a rotary tool for trimming boot and shoe soles was well known long before the Orcutt cutters were made.*" In answer to Cross-Int. 53, Andrén says that Orcutt's cutter "*is a multiplication and duplication*" of Bigelow's cutter.

COMPLAINANT'S PATENT CUTTER IS SERVILELY COPIED FROM BROWN'S PATENT OF 1864, EXCEPT PERIPHERAL CONFIGURATION, WHICH IS COPIED FROM THE OLD HAND PLANE, WITH EQUAL SERVILITY.

The second specification in relation to the state of the art, at date of Orcutt's invention, is that Orcutt's cutter is made, in every material respect, in servile imitation of Brown's patent cutter, except the peripheral configuration, which, as already shown, was copied with equal servility from the hand plane.

See Noble, printed record, p. 295, Ints. 20, 21, and Cross-Ints. 28, 33, 39, 41 and 42, same record. See also Noble, p. 128, where he states the differences between Brown's patent cutter and Orcutt's to be the peripheral forms.

Corthell, Ints. 88–97, pp. 323–4, printed record, shows that all parts on periphery of Orcutt's cutter are in the earlier hand planes, and had been known for twenty years. Corthell, Cross-Int. 111, same record, shows that the method of forming the hand planes is identical with that of Orcutt's cutter, by turning in a lathe. Mann, a manufacturer of hand tools, called by defendants, testifies (Cross-Int. 34, p. 335, printed record) that the hand tools are moulded by swinging on a centre, which is the way Orcutt's cutter is moulded.

And Orcutt himself, in Ints. 5, 6, 7, p. 299, printed record,

as already quoted, sums up the difference between his cutter and Brown's, to be, that Brown's lack the ridges 1 and 2. Mitchell, defendant's witness (printed record, p. 105), a machinist, but utterly ignorant of sole trimming, shows that any practical cutter maker, having a sole edge as a sample, can make the Orcutt cutter, and will make nothing else; had had an order from the office, with the Exhibit Mitchell Boot, with instructions to make a cutter with a stated outer diameter, and size of hole for the arbor, and to trim an edge like that boot; and the product was the Exhibit Mitchell Cutter. He testifies that he never made a sole-trimming cutter before; that any workman, of ordinary experience, in making milling cutters, can make a cutter to trim soles, and that the only special tools required were the Exhibit Mitchell Template and Forming Tool.

As incident to this question, the testimony of Bunnell (printed record, Ints. 20–22, p. 358) shows that before Orcutt's invention, Brown's cutter had been made and used in almost endless varieties of peripheral form. And Coleman, Cross-Ints. 43, 44, p. 33–4, printed record, admits that as early as 1875 or 1876 the idea of forming Brown's cutters, with various outlines, "*spread to a very large extent in this country.*"

Andrén, defendants' expert, Int. 16, p. 618, printed record, after a full comparison, says: "*In fact, I find the said Colt's armory cutter to contain all the elements substantially like those described and shown in the Orcutt patent, saving differences in diameters and widths, which changes are immaterial, and not substantial differences,*" which cutter, as appears, was made and used long before the date of Orcutt's alleged invention.

FALLACY OF APPELLANTS' PRETENCE THAT USE OF RAND GUIDE WITH CUTTER, IS NOVEL, OR PROOF OF NOVELTY.

One of appellants' assumed elements of novelty is the use with Orcutt's cutter of a rand disk or guide. See Coleman, Int. 3, p. 21, printed record, where he enumerates

the rotary rand guide as an ingredient in Orcutt's cutter; and in answer to Cross-Int. 87 he again asserts that the adapting of Orcutt's cutter to use with a rand guide is an element of Orcutt's invention. But in Cross-Ints. 90, 91, 92, 111, 162, 163, 164, Coleman admits, that with the Orcutt cutter the rand guide "*performs no new office*"; and that "*it (the cutter) acts with a rand guide substantially as other rotary cutters did.*"

Coy, another of appellants' experts, in Cross-Ints. 120, 121, 122, 126, p. 110, printed record, is nevertheless inclined to the idea, that although, as he admits, rand guards with rotary cutters were old before Orcutt, yet, as in other cases, the rand guard had aided in holding a sectional cutter in place, while Orcutt's cutter was in one piece; therefore such guard with Orcutt's cutter was a novelty. (This shows the desperate search of complainants for novelty.)

That a rand guide with a rotary cutter, was old, see Noble, printed record, p. 125; also Corthell, Int. 98, p. 325; showing that from 1873, at least, such rand guide had been common in rotary edge trimmers of divers styles. Andrón, Int. 20, p. 188, printed record, cites divers earlier patents showing rotary cutters with rand disks or guards, and in Int. 15 he shows that in Exhibit Bigelow Hand Cutter, the tooth of the cutter, the guard and the lip of the guard are identical with that used by Orcutt. Complainants have also attempted to establish novelty in Orcutt's cutter, by reason of the fact that its end, where the rand guard rests against it, is a perfect plane, and that, therefore, the teeth in Orcutt's cutter differ from those in the Exhibit Hand Tools (see Coleman, Cross-Ints. 104–108, pp. 108–9). But in said Cross-Int. 108 divers older patents are cited, in which the ends of the cutter, next the rand guard, is in great variety of form, so that the witness abandons the rand guard theory. See also Martland, Int. 14, p. 343, printed record, and Eppler, Int. 24. p. 158, showing that the rounded side face of the hand tool next the rand cutter is incidental to manufacture, and is immaterial. See also Parks, p. 290, printed record, Ints. 10–13, that their rand lip is the only difference between Brown and Orcutt cutters.

FACILITY FOR SHARPENING APPELLANTS' CUTTER IN NO RESPECT NEW OR NOVEL.

Another theory of complainants for establishing novelty in Orcutt's cutter, and much expatiated upon by their witnesses, is the facility for sharpening, without change of peripheral form, (see Coleman, Int. 3, p. 20, printed record). But this is in no respect new, either in rotary or band cutters, (see Coleman, Cross-Ints. 101, 113), where in the latter he admits that, in facility and effect of sharpening, Brown's cutter and Orcutt's "*are alike in those respects.*" And in Cross-Ints. 184, 185, Coleman makes the same admission with reference to the Knights cutter; but illogically claims that there is a difference in that Orcutt has *more parts* than are in the Knights cutter. In Cross-Int. 186, Coleman admits a facility of sharpening the old Busell cutter equal to Orcutt's. In Cross-Int. 193, Coleman admits that Orcutt has no greater facility of sharpening than if other forms of periphery were employed. See also Coy, Cross-Ints. 41, 42, p. 98, printed record, that old Busell cutter and the Brown cutter have the same facility for sharpening. See also Noble, pp. 296–7, printed record, Ints. 29, 33, to same effect as to Brown cutter. Martland, p. 343, printed record, Int. 13, shows that the front face of the hand tool was the only part sharpened. Crisp, same record, p. 352, Cross-Int. 11, testified to identity of sharpening hand tool and Orcutt's. See also Bunnell, same record, p. 358, Int. 19; Thompson, same record, p. 159, Int. 11; Stephenson, pp. 170–1, showing that in fact, in many cases, the old fine tooth cutters were sharpened in the same manner as Orcutt's; and Buzzell, p. 175, same record, is to the same effect, and that there is nothing new in the facility or result of sharpening Orcutt's cutter. The theory of Coleman, Cross-Ints. 184, 185, and Coy, Cross-Int. 41, that a new result is produced in sharpening Orcutt's cutter, because it has more parts than Knights' or Coté's cutter, is fallacious, and besides, is answered by the hand tool, which has the same parts and is sharpened in the same way; and the *use* of Brown's cutter

for metal and Orcutt's for leather, has no effect to create or prove novelty in the method of sharpening Orcutt's cutter, for even if this cutter was new, the sharpening is but a double use for the tools by which such sharpening is effected.

RAKE OF THE TEETH IN APPELLANTS' CUTTER IN NO RESPECT NOVEL.

Another of the theories of complainants is that Orcutt's cutter must possess patentable novelty because of the "*rake*" or overhang of the teeth. Coleman, in answer to Cross-Int. 57, and as a noon recess inspiration, first enunciated the idea that "*rake*" in Orcutt's cutter was an essential element. Orcutt claimed nothing of the kind, and only alluded to it incidentally; as his earlier patent — of 1879 — shows rake, while his patent in suit is uncertain in that behalf.

In answer to Cross-Ints. 93 and 99, Coleman, on the whole, is again inclined to the theory that rake constituted an element of Orcutt's invention; but whether in a patentable sense, he declines to say (see Cross-Ints. 95, 96, 97); and in declining to answer draws a very nice distinction between his answer to direct Int. 7, when he freely stated that he believed Orcutt's cutter an invention, but deems a question as to whether a claimed feature of novelty is a patentable invention an improper question. In Cross-Int. 114, Coleman again refuses to state whether he deems "*rake*" a patentable invention in Orcutt's cutter. As a sample of the theory and testimony of this witness as to what is or is not invention, attention is called to his answers to Cross-Ints. 114 to 118, in which, when he is asked whether, in stating that the production of a thing is invention or not, he means patentable or non-patentable invention, he evades the question and will not answer. In answer to Cross-Int. 169, Coleman thinks that rake, in connection with other elements, constituted invention; but in Cross-Int. 170, that in Orcutt's cutter it performs no other office than in old Busell cutter, except that Orcutt trimmed more forms of sole edges. In Cross-Int. 174, it is not in-

vention *per se;* but in Cross-Ints. 175, 176, Coleman claims that new function is produced by rake in Orcutt's cutter, *because more work was done.*

In Cross-Int. 222, Coleman admits that the Tayman cutter has rake, but not with a moulded top; and in Cross-Int. 223, he admits that "*rake*" in Tayman's cutter performs the same function as in Orcutt's, but that Orcutt's has more parts. In Cross-Int. 237, Coleman admits that rake in the Exhibit Hand Tools is greater than in Orcutt; and in Int. 238, it is more than in Corthell and less than in the Exhibit Hand Tools.

And in Cross-Int. 241, Coleman admits that he cannot tell by Orcutt's patent drawings what the rake is.

Coy, another of complainants' experts, says (Cross-Int. 29, p. 96, printed record) that rake in Orcutt and Exhibit Hand Tools is alike; in Cross-Int. 53, that old Busell cutter has more rake than Orcutt; in Cross-Int. 60, that it is common for operators to change the rake, according to the material being cut; in Ints. 61, 62, that workmen using milling cutters change the rake in the same way; and in Cross-Int. 65, he admits that "*rake*" in Orcutt and old Busell cutter performs same duty.

In Cross-Ints. 168, 199, Coy says that rake in Orcutt cutter will not maintain the cut without pressure, and that the pressure must be sufficient to sink the teeth into the sole. Noble, in printed record, Ints. 28, 41, 42, pp. 296, 298 before quoted, and in p. 127, where he gives his view *in extenso* of the novelties of Orcutt's cutter, is silent upon any subject of rake; in fact, it is not to be denied that to Coleman must be awarded the credit of discovering the remarkable *rakishness* of the tool. Anthony, one of complainants' witnesses, p. 248, printed record, Cross-Int. 39, says, "*the matter of giving teeth more or less rake, according to the duty they were to perform, has long been well understood by those skilled in rotary cutters.*" This witness further says, Cross-Ints. 30, 34, 40, that from 1862 to 1878 he was making cutters like that shown in the Stevens cutter for cutting wood gun stocks; that these cutters had more rake than the

Exhibit Eppler Cutter or Exhibit Experimental Stevens Cutters; thus showing that rake is not new in Brown cutters, nor is it new to use these cutters on soft material. Witness also says, Cross-Int. 44, in substance, that rake, or hooking, is a substitute for clearance; in Cross-Int. 47, that for many years "*the inclination of the front face of the teeth of rotary cutting tools so as to produce good results has been well understood.*" And in Cross-Int. 49, Anthony says a skilled person "*can readily determine in any given case for performing any given job the proper diameter of a cutter, the proper number of teeth, the proper depth of slot between the teeth, and the proper inclination of the front face of the teeth, relative to a radial line, as also the proper backing off or clearance upon the periphery.*" This, if believed, leaves nothing in fact but the form of the periphery to be discussed.

Coleman, in Cross-Int. 6, gives, in fact, the entire advantage of rake or undercutting the front of the teeth, in that "*it saves grinding*" away so much metal; and in Cross-Int. 10 he gives the same reason, as also that it facilitates bending back the teeth, which is complainants' method of making their cutters; just as the old hand tools were made. Corthell, p. 137, printed record, Int. 24, says rake is not requisite if sufficient clearance is given to produce a cutting angle. Int. 24, this witness shows that he trimmed with one cutter having rake, and another with teeth inclined back, and they worked equally well. Kingsley, p. 143, record, Ints. 8, 9, says Orcutt cutters cut only dust, never shavings; Int. 13, common practice to vary rake or overhang of teeth; Ints, 14, 15, rake is immaterial. Miles, Ints. 6–8, p. 147, record, says rake is no benefit. He grinds the teeth back of centre, don't then catch; Int. 9, complainants' cutters are about straight at cutting part, are so after one grinding; Int. 10, two of Exhibit Worn Cutters not hooking, one is; Int. 11, I never saw an operator grind teeth hooking, except when almost worn out, then to get more use out of it, as by so grinding he preserves its outline. Moore, Int. 10, p. 151, record, rake nothing new; Int. 11, upper part of Exhibit Busell Cutter (Orcutt patent of 1881, now in suit) practically a radial line.

Eppler, Int. 12, p. 155; front face of teeth as various in angle as there are operators, some ahead and some back of centre. Int. 13, defendants' Exhibit Worn Cutter No. 12, M. C., one sixteenth reverse of hooking; Int. 14, even the two cutters, marked Exhibit Busell Cutter (Orcutt patent of 1881), are not raked alike. Int. 14*a*, teeth are undercut to facilitate grinding. Int. 15, "*in nine cases out of ten the operator would grind it so it would be less hooking than the cutters inquired about (Exhibit Busell Cutter, Orcutt Patent of 1881); Int. 16, defendants' Exhibit Corthell Cutters 1 and 2, reverse of hooking, and work as well as any cutter exhibited to-day. Int. 19, complainants make their deep cuts to allow bending back the teeth.*" Int. 20; in milling cutters, rake is "*notional*" with mechanics, one claiming that rake is best, and others that a scraping cut is best. Int. 21, the Exhibit Milling Cutters vary as to front line of teeth. Thompson, Int. 12, p. 159; operators usually have teeth on radial line. Int. 16; used Exhibit Corthell Cutters Nos. 1, 2, 3; No. 2 done best job, No. 1 next, No. 3 poorest. Int. 17; no advantage in rake.

Stevens states (p. 164, printed record), Int. 5; during last fifteen years rake in mills (cutters) has varied from one thirty-second to three-eighths, according to use. Int. 6; known old Exhibit Busell Cutter eight years; similar ones, nine years. Int. 7, and for eight or nine years these cutters had same rake. Int. 8, benefit of rake, if any, same in old Busell cutter as Orcutt's. Int. 10, nothing new in rake of Orcutt from what was well known before. Int. 11, rake just as useful in ratchet teeth as in Brown's cutter teeth.

Andrén, Int. 17, p. 176, no invention in rake of Orcutt's cutter teeth; states reasons fully. Int. 24, Colt's armory cutter, No. 4, has raking teeth like Orcutt.

Young, Int. 12, p. 118, record, cutting part of Exhibit Busell Cutter (Orcutt patent of 1881) not hooking. Int. 13, base of teeth undercut for grinding.

Coy, the appellants' expert, Cross-Int. 171, p. 118, record, cannot tell by complainants' patent what is the rake of the teeth.

PERIPHERAL FACE OF TEETH IN APPELLANTS CUTTER DOES NOT (AS CLAIMED) OPERATE AS A GUARD.

Another theory set up by appellants to prove novelty in Orcutt's cutter, is that stated by their expert, Coleman, Int. 6 p. 26, printed record, and in other places, that the top of each tooth acts as a guard to gauge the depth of cut of the succeeding tooth. In refutation of this theory, defendants cite the following testimony. Coleman, Cross-Int. 64, admits that velocity is an equivalent to some extent for the claimed peripheral guard; and appellees claim that with a proved velocity of more than 7,000 revolutions per minute, that 112,000 teeth per minute act upon the leather, and hence 1,866 teeth so act per second, and only the cutting edge can be in contact with the leather; and the theory of a peripheral guard is a false theory. Defendants cite the following testimony in support of this view: Coy, appellants' expert, admits, Cross-Int. 36, p. 97, printed record, that depth of cut may be varied by pressure, under various conditions stated by him; and if so, where is the efficacy of the claimed peripheral guard?

So in Cross-Int. 37; with worn cutters could vary depth of cut one half, according to stock being cut. Ints. 45–50, he admits that the guard, if it exists in Orcutt's cutter, varies as the teeth are worn away by grinding. Int. 51, he admits, in fact, just what defendants claim, that edge of tooth is the guard, and not peripheral face serving as a guard for the next tooth. Ints. 73, 76, thinks depth of cut would vary one half between new and worn cutters. Ints. 143–147, he asserts that acuteness of cutting edge will affect depth of cut (which is true), and he denies that all of top of teeth act as a guard. In Ints. 149–152, he shows that, if such guard exists, it is always varying as the cutter is worn. Int. 162, witness says: "*In the process of trimming the shoe sole (with Orcutt's cutter), skill on the part of the operator is necessary to prevent gouging.*" Thus showing that "*skill on the part of the operator*," and not a peripheral guard, is the

safeguard. Ints. 163–170, witness admits that pressure of the shoe against the cutter and at varying degrees is requisite. If there is a guard, what need of varying the pressure?

Noble nor Orcutt, in all their testimony in the Corthell suit (the testimony wherein, is part of the record in this suit), made any pretence to this newly developed theory of a peripheral guard. But in this suit, while Orcutt is silent about this new discovery in his patent, Noble comes to the rescue, and in p. 126, printed record, discovers the "*guard*," sees it plain, for the first time.

Corthell, when questioned as to the matter of a guard, stated, Int. 87, p. 323, that each tooth is a guard for the following tooth, and that the space between the teeth and the clearance on top *assists* in determining the depth of cut; and in Int. 88, that the depth of cut in the hand tools is determined in the same way. This is true; the degree of clearance affects the acuteness of the teeth, and as stated by Crisp, that affects the depth of cut. Crisp, defendants' expert, Cross-Int. 19, p. 353, printed record, says that triangular piece at front of hand plane is but an incident of manufacture; thus showing it is not a guard, as complainants have contended.

Corthell, Ints. 29, 30, pp. 140–1, printed record, shows that pressure regulates depth of cut. Ints. 31, 32, he says Orcutt cutter requires more care than Exhibit Busell or Bolling cutters; that Brown and Sharpe cutter (Orcutt's) will, unless special care is taken, "*yank*" the shoe out of the operator's hands; has known them to be thus thrown through a window, and then, if not too deeply cut, operator will take them, and, with care, will finish them with a good edge.

Kingsley, Int. 16, p. 144, says that depth of cut is governed by the operator.

Miles, Ints. 12, 13, p. 148, printed record, says Orcutt cutter most difficult to use; has known soles so badly injured by them as to require new soling. Int. 15, there is no guard to depth of cut; is varied by pressure; if he could not vary cut, could not trim at all.

Eppler, Int. 11, p. 155, says there is no guard; cutters are used till only one sixty-fourth of an inch thick on the periphery. Int. 17, old Busell cutters, Corthell cutters 1 and 2, worn cutters, and Coté Knights cutter are all alike in this respect. "*I claim there is no guard.*"

Thompson, appellees' witness, says, Int. 13, p. 160, worn cutters 5 and 11 not worn away more than usual in such cutters. Int. 14, think worn cutter 11 works better than a new one; think No. 5 makes a finer edge than a new cutter. Int. 23, don't think Orcutt's cutter has a guard; it works best when three-quarters worn out. Int. 24, operator can cut as deep as he likes.

Andrén, Int. 21, p. 189, says that with a velocity of seven thousand revolutions per minute, the number of teeth acting per minute would be one hundred and twelve thousand; number per second, one thousand eight hundred and sixty-six. Int. 22, periphery of teeth cannot act as a guard. Int. 23, old Busell and Knights cutters have as much guard as Orcutt's when equally worn. Cross-Int. 29, if Orcutt has a guard, so have all the hand planes. Cross-Int. 34, no guard in hand plane unless at top of teeth. Cross-Int. 40, in using hand plane, workmen can vary thickness of cut by set of tool. Cross-Int. 41, witness demonstrates, by using Bigelow cutter without the guard, that the guard is not indispensable. Cross-Int. 47, only cutting edges act as guard in rotary cutters. *See reasons given.*

ABILITY TO SHARPEN TEETH OF CUTTER WITHOUT CHANGING THEIR PERIPHERAL FORM, NOT AN ELEMENT OF NOVELTY.

Complainants have repeatedly referred to the fact that Orcutt's cutter can be sharpened without changing its form or drawing its temper; but if it is really intended to prove novelty by such fact, it is readily refuted by the testimony. That it was not new to sharpen the rand cutter without drawing the temper thereof is shown by Coleman, Int. 3, p. 19, such a rand cutter being shown in Busell's patent of 1875,

And the Corthell patent of August, 1878, had a cutter which could be ground without change of form or drawing of temper: see Coleman, Int. 3, p. 20. And in the Exhibit Old Busell Cutter and Coté Cutter (Knights patent) there is the same facility for sharpening, and without either drawing the temper or changing the form. So, too, in the Exhibit Hand Planes, which have teeth identical with Orcutt's. Besides this, complainants' theory that the so-called burr cutter cannot be sharpened upon the front of the teeth without drawing the temper or changing the form, is totally disproved by Moore, defendants' expert, Int. 16, p. 161, who says it is practical to sharpen Exhibit Colt's Armory Cutter No. 2 by grinding the flat front faces of the teeth. Busell, p. 175, says that burr cutters can be sharpened by grinding the flat front face of the teeth, in which case the cutter is held in the hand; while if the teeth are like the Brown and Sharpe cutter, an automatic grinder may be used. Stephenson, vol. 1, p. 170, printed record, testifies to the same fact, and presents a cutter marked "*Defendants' Exhibit Stephenson Cutter*," made by him fourteen years before, which is adapted to be ground on the front of the teeth, without drawing the temper or changing the peripheral form. And Noble, Int. 29, p. 296, record, admits that there is no difference between the Orcutt and Brown cutter in facility of sharpening. Hence (unless it be a "*double use*"), nothing in that behalf can be claimed.

ROTARY WELT KNIFE, IN ONE PIECE WITH CUTTER, NOT GROUND OF NOVELTY.

Another incipient ground of novelty in Orcutt's cutter was that it had "*a rotary welt knife in one piece with the rest of the cutter.*" See Noble, Int. 13, p. 293, printed record; and p. 125, *ibid.*; see also Coy, Cross-Ints. 97, 116, 117, pp. 108 and 109–10. But this witness also thinks that a cutter made in three parts instead of one would still be Orcutt's cutter; and as a specimen attempt to show novelty, attention is called to Coy's answers to Cross-Ints. 97 and 116–123. But when Noble was asked, in Cross-Int. 27, p. 296, printed record,

whether there would be any difference if a cutter was made with parts 1, 2, and C, in complainants' patent, each separate, or all in one piece, he admits that there would be no difference. And Johnson, Int. 17, p. 308, says that cutters in one piece or in gangs (parts), are equally well known. Parks, Int. 18, p. 291, printed record, gives the same testimony; and so also does Bunnell, Ints. 5, 6, p. 356. Moore, Int. 19, p. 152, testifies to the same fact. It should be added that Corthell's Exhibit Patent of 1878 has the rand cutter in one with rest of cutter; and that when this complainant company was seeking injunctions against Eddy, White, Keith *et als.*, under the Tayman patent, having a cutter in three pieces, the ground of action was the making and using of a cutter in one piece, exactly like Orcutt's.

ROTARY VELOCITY OF CUTTER, WHEN IN USE, IN NO RESPECT NOVEL.

Velocity is brought forward by complainants as an evidence of novelty in Orcutt's cutter. See Noble, p. 127, printed record, where he contrasts the speed of trimmers with milling cutters. Coleman, following Noble, also introduces, in answer to re-direct Int. 210, the element of velocity; and in Cross-Ints. 227, 229, this witness thinks that velocity given to Orcutt's cutter constitutes an element of novelty therein, when "*compared with metal cutters*"; and in Cross-Ints. 230, 231 and 232, the witness, after divers evasions, admits that speed in Orcutt's cutter "*did not, per se*," constitute invention. Attention is called to these four questions and answers, Cross-Ints. 229–232, as a fair sample of the difficulty encountered in eliciting responsive answers from this witness. In Cross-Int. 226, Coleman admits that the velocity of Orcutt's cutter is about the same as other leather cutters. Coy, Cross-Int. 66, p. 102, printed record, states that Orcutt effected no change or improvement in peripheral speed of rotary cutters, and it is evident that nothing new as regards velocity was brought forward by Orcutt.

TRIMMING RAND, BED, AND GUARD, AT ONE OPERATION, NOT NOVEL, BUT OLD IN THE ART.

Another of the assumptions of novelty, by complainants, is that the Orcutt cutter will, at the same time, trim the rand, bed, and guard of the sole. See Noble, Int. 14, p. 293, printed record, where he asserts that Orcutt's cutter would trim the rand with the other parts of the edge; and that he meant that Orcutt's cutter would trim *all of the rand* at the same time that it trimmed the rest of the edge, is shown by his answers to said Int. 44, and to Cross-Ints. 24, 26, same record. But, in fact, it has for thirty years been a common practice to trim the rand, bed, and guard at the same operation, with the hand planes (see Exhibit Dunham Patent, No. 15,176; Martland, Int. 4, p. 342, printed record; and Mann, Int. 15, p. 333, same record). It had been common for years before Orcutt's cutter to trim the rand and bed with the Tayman rotary cutter; it had been common for years before Orcutt's cutter to trim the rand, bed, and guard with the Bolling and old Busell rotary cutters; and further, the Orcutt cutter does not and cannot take out the rand; it merely levels off any inequality that may happen to be left by the previously used hand rand cutter.

The proof of the correctness of these propositions is cited as follows: Noble, p. 124, printed record, says that Corthell's cutter, patent of 1878, "*did its work well*"; and on page 129, he says this same cutter "*has a rand lip, a bead, a bed and a guard.*" Thus this patent had all the cutting parts claimed in Orcutt's, and "*it did its work well.*" True, Noble said there were objections to it, but these will be noticed under another head. Noble, p. 293, printed record, Int. 12, says Tayman was first to use a rotary welt cutter; but that patent is not now in suit. See also Cross-Ints. 31, 32, same record, that Tayman cutter can produce same result as Orcutt's. See, also, Noble, p. 125, that the Davis and Howe cutter, patent of 1874, had a rotary rand knife,

Noble, p. 125, printed record, says that the knife in Busell patent of 1875 was an improvement on Davis and Howe's, and were put on the market with a rotary rand guide. Noble, section 9, p. 131, printed record, states that in the Busell patent 188,337 of 1877, "*the rand knife and rand guard are shown upon a small spring shaft E, while the Knights cutter and sleeve are on the main shaft*"; and further says, "*We made a good many machines in that way.*" These cutters trimmed the rand, bed and guard. Corthell, Ints. 11, 14. p. 313, printed record, says it is the practice, in all good work, to cut the rand before trimming with Orcutt's cutter; and in Int. 18, Corthell states that it is not practical to cut the rand with a rotary cutter, unless on a separate shaft. Int. 19, Corthell states that the rand lip, when used with the rest of the cutter, finishes the rand. Ints. 21, 22, Corthell states that the cutter marked "*Defendants' Exhibit Thompson Rand and Sole Edge Trimmer was used in 1878, and that it would cut the rand, bed, guard and bead, the same as Orcutt's,*" if made with the same outline as this is (Thompson's cutter). Ints. 26, 29, Corthell shows that in the fall of 1874, the Coté machines were in use at various places stated by him, and that these machines trimmed both the rand and sole edge. Ints. 30–33, Corthell shows that cutters made under defendants' Exhibit Busell Patents, and adapted to remove the rand and trim the sole edge, were put in use in 1876 or 1877, and were in use at the time of his testifying (in 1882). Int. 35, the witness states that the Busell cutter was better than the Orcutt cutter for removing the rand and trimming the edge at the same time; and in Ints. 36, 37, he fully explains the reasons for such opinion. Ints. 40, 41, 42, witness states that in winter of 1874–75, Mr. Bolling attached to a Coté trimmer, at C. R. Ford's factory at North Bridgewater, cutters that cut on the bottom of the sole and left the edge of a uniform thickness. Ints. 43–45 show that Corthell made, in 1877, a machine with a rotary rand cutter on one shaft and an edge trimmer on another shaft, which saved the hand process of randing.

Martland, p. 345, printed record, Ints. 30, 31, states that in all cases in his knowledge they take out the rand by a hand tool before subjecting the edge to a rotary cutter; that he makes such hand tools, and, so far as he knows, they are used with complainants' rotary edge trimmers. Draper, p. 204, printed record; a trimmer of eleven years' experience, states that with the exception of the old Busell cutter, having the rand lip inserted, he never saw one that would successfully take out the whole of the rand at the same time that the sole was being trimmed. Int. 17, that it is "*the usual plan either to have the rand cutter rotate on an independent shaft or to take it (the rand) out with a hand tool.*" Int. 18, witness states that the right-hand portion of the sole of Corthell shoe No. 12 shows a shoe sole as prepared for being trimmed with Orcutt's cutter. It should be observed that Noble, p. 271, printed record, denies the truth of the statements made in this behalf by Corthell, and claims that ninety per cent. of all the work done by Orcutt's is on edges trimmed entirely at one operation; but in fact this affidavit was given by him before much of the evidence above quoted had been given; while on the other hand, Coleman, at the only time when he ever saw soles being trimmed by a rotary cutter, found them being randed by a hand tool (pp. 32–5, printed record, Cross-Ints. 35–41). Coleman further admits, Cross-Ints. 88, 89, that Orcutt "*was not the first to provide a tool that would trim the rand, the bed and the guard at one and the same operation.*" On pp. 128–9, printed record, Noble admits that earlier cutters than Orcutt's had "*rand, lip, bed and guard,*" but, as he says, not formed in one blade or tooth; but as he himself testified (Int. 27, p. 296, printed record) that a cutter made with the parts represented at 1, 2 and C, in complainants' patent each separate, would be the same as a cutter made in one entire piece; that is, that a cutter in three pieces is the same as if in one piece; how can it be material whether the rand, lip and guard are in one piece or in three pieces? Noble, as before quoted, admits on p. 129, that Corthell's earlier patent shows a cutter that has a rand, lip, a bed and a guard, and may have

a channel guard. Jones, p. 337, printed record, testified as follows: —

Int. 5; Busell machine, with flexible shaft inside arbor, cuts rand and bed; (this machine and the patents upon it long antedate complainants' patent, and their exhibit catalogue shows them still in use). Int. 8, can't cut rand with Orcutt's cutter; it is first cut by hand. Cross-Int. 12, ridge next rand guide in Orcutt cutter "*simply cleans the upper edge*" (the rand). Cross-Int. 13, Orcutt's rand lip cuts "*very small part*" of rand. Cross-Int. 15, Orcutt cutter "*does not take out the rand.*" Cross-Int. 16, Orcutt cutter "*takes out a slight portion of the upper edge, but not the whole rand.*" Cross-Int. 20, the main body of the rand is taken out by hand. Thompson, same record, p. 340, Ints. 10, 11, 12, 13, says it is not practical to cut the rand with Orcutt's cutter; that it is cut by hand; that they make from eighty to one hundred cases, twenty-four pair cases, per day, and rand all by hand; that he never saw the edge trimmed and rand cut at same operation with Orcutt's cutter. Cross-Int. 20, witness says Orcutt's rand cutter takes off the feather edge. Corthell, Int. 24, p. 139 printed record, states that Exhibit Corthell Shoe No. 11 is trimmed with the edge of a uniform thickness, as they trimmed them in 1876–77 at Brockton. Miles, p. 184, Ints. 17, 18, says there is not any class of work of good quality that Orcutt's cutter will rand; that Exhibit Corthell Shoe No. 12 shows on the right-hand side the usual method of cutting out the rand by hand before trimming with the Orcutt cutter.

Thompson, p. 340, printed record, Ints. 4, 5, 10, 15, 25, shows that he is an operator of great experience; has used Orcutt's cutter, also many others; old Busell cutter comes nearest to taking out rand at same time that sole is trimmed: about the only difference in result between Coté cutter, Knight's patent, and Orcutt's, was that latter cut a bead (but the bead is no part of Orcutt's patent, and was venerable in use long before Orcutt's patent). That Orcutt's cutter cannot take out the rand. That Corthell shoe No. 12, on right-hand side shows the usual hand randing before trimming with Orcutt's cutter.

Johnson, p. 307, printed record, Ints. 10–13, states that the only difference between the Exhibit Hand Tools and Orcutt's cutter is that in one the teeth are in the arc of a circle, and in the other an entire circle; and that in Orcutt's cutter the teeth can be removed (meaning his patent), while in the hand plane they cannot, thus showing that the result is the same. Corthell, Int. 6, p. 312, printed record, says hand planes have been in use since 1858. Int. 9, hand planes trim all parts of sole to same extent as any rotary or other hand tool, except the tool called the welt or rand knife. Ints. 21, 22, Thompson's rand and sole edge trimmer was used in the first part of 1878; it would cut the rand, a bead, the bed, and on the bottom of the sole. Ints. 36, 37, Corthell fully explains why Orcutt's cutter *cannot* cut the rand, and why the machine shown in Exhibit Busell's Earlier Patent will cut it. Cross-Int. 82, Corthell states that there is a class of work on which the rand lip on Orcutt's cutter serves "*the same purpose as to take it* (*the rand*) *out by hand.*" Others have testified that a very inferior class of work can be so trimmed. Int. 109, Corthell states that you can trim just as good an edge with the hand tools as with Orcutt's. Stevens, p. 330, printed record, Int. 20, also states, as did Corthell, that he saw Thompson rand and sole edge trimmer in the spring of 1878.

In view of the numerous statements of complainants as to the manner of using rotary cutters, it is deemed proper to show that the method of using complainants' cutter is in no respect different from the method of using other rotary cutters. See Colman, Cross-Int. 137, and Corthell, pp. 133–4, printed record, Ints. 4, 5, which show that the manner of using rotary cutters to trim shoe soles has been in no respect changed by Orcutt.

USE OF BROWN'S PATENT CUTTER (OF 1864) IN A SOLE TRIMMING MACHINE, NO GROUND OF NOVELTY.

Another of complainants' theories for proving novelty in Orcutt's cutter is that it is used in a manner and in an organi-

zation entirely different from what Brown's cutter was originally intended to be used. See Coleman, Int. 3, p. 21, printed record, Int. 6, p. 25, Cross-Ints. 94, 227; Noble, p. 127, record. In these answers, the *use* of the cutter and the organization in which it is used when milling iron or trimming soles is dwelt upon by the witnesses. In answer to this theory, it is sufficient to state that in either use of the cutter, it is used in an old and well-known manner to produce an old and well-known result; which result is tersely and correctly stated by Corthell, Cross-Int. 30, p. 215, printed record: *Q.* "*Do you think the results of the two modes of operation (milling metal and trimming soles) are substantially the same?*" *Ans.* "*You get the same moulding or outline in the two cases, provided you use the same cutter; that is the only result there is.*" And that is all there is of this theory. The cutters in both cases rotate, this is old; the material in both cases is old; in so far as reducing it with rotary cutters is concerned, it is held in the old and well-known way in both cases, and no new result is brought about. See also, as germane to this part of the case, Corthell, Cross-Ints. 25–29, p. 214, printed record, as to speed, holding the material, gauging depth of cut, and mode of operation.

ECCENTRICITY OF OUTER (PERIPHERAL) FACE OF TEETH OF CUTTER, IN NO RESPECT NOVEL.

Another attempt of plaintiff to prove invention, is that the eccentricity of the top of the teeth in Orcutt's cutter is something new. See Coy, p. 105, printed record; Cross-Ints. 86–88; see also Coleman, Int. 210, p. 77. But *per contra*, see Noble, Cross-Int. 28, p. 296, printed record; says the eccentric top of Orcutt's cutter is like Brown's. Mann, same record, p. 331, says clearance was produced in hand tools (Mann's edge cutter) by bending back the teeth. Ints. 3, 6, these cutters were made in 1875. Int. 10, Exhibit Snell and Atherton Cutter in use for thirty years. Int. 14, clearance in these cutters produced by bending back the teeth. Int. 15, Dunham edge cutter exhibit have known for

twenty-five years. Int. 16, used in this and probably in all foreign countries. Cross-Ints. 35–38, witness explains how teeth are bent back to produce clearance, or eccentricity of top of teeth, just as in complainants' cutter. Cross-Ints. 39, 42, the witness expresses the belief that the hand tools and complainants' cutter "*are one and the same thing.*" Martland, same record, p. 342, Ints. 4–6, shows that by a lever, twenty-nine years ago (just as in Orcutt's patent of 1879, and as his cutters are now made) they had bent back the teeth of the Exhibit Snell and Atherton Hand Plane, to to give clearance. Crisp, same record, Cross-Int. 22, p. 350, says that "*so far as relates to face and clearance of teeth (which latter is eccentricity) the Brown patent gear cutter, Brown and Sharpe milling cutter 1, Brown and Sharpe milling cutter 2, and Colt's armory cutter are substantially the same as the Orcutt cutter.*" See also Andrén, Cross-Ints. 47, 48, p. 196, where he shows that eccentricity in Orcutt's cutter is not operative as a guard, and therefore it is clear that eccentricity is not peculiar in its effect in that cutter.

SPACE BETWEEN THE TEETH OF COMPLAINANTS' CUTTER NOT PECULIAR OR NOVEL.

Yet another theory set up as distinguishing Orcutt's cutter from all milling cutters, is that the space between the teeth is unlike that shown in other cutters. See Coleman, Cross-Int. 58 and Cross-Int. 97. This is a part of the new revelation received since the bringing of the present suit; nothing of the kind appeared before, (see Noble, Corthell record, Cross-Ints. 20–22, p. 295, printed record; the testimony in said suit *vs.* the Corthell Company by these complainants, having been stipulated into this case, as appears on p. 221, printed record.) That this theory is fallacious and chimerical is shown by the fact that at every sharpening of the cutter the space between the teeth is varied, and hence there can be no rule about it. See Coleman, Cross-Int. 63. The fallacy of this pretence is also shown by Corthell, Int. 28, p. 140, printed record, in which he shows that Exhibit Brown's Patent Gear Cutter, having but *twelve teeth*, the Exhibit Old Busell Cut-

ter, and defendants' Exhibit Corthell Cutters 1 and 2, of about the same diameter as the Brown gear cutter, have each twenty-two teeth, and all trimmed equally well. That the Brown and Sharpe cutter, made by complainants, of less diameter and having sixteen teeth, gives about the same result. He had also used cutters like defendants' Exhibit Worn Cutters, having double the space between the teeth, and they worked equally as well as when new. And this experienced witness further states that the "*only necessary requirements of such tools in regard to the number of teeth in a cutter of proper diameter, are, first, that there shall be sufficient space between the teeth to admit of their being ground with an emery disc; and second, that the teeth shall not be so few in number that when nearly ground away by repeated sharpening, the spaces between them shall be too great to do good work; for the less teeth there are in number, with given spaces between them, the greater distance will each tooth extend along the circle from its front to heel when new, and consequently the greater will be the distance between the teeth when worn out.*"

And Kingsley, Ints. 14, 15, p. 144 printed record, states that the number of teeth is not material, and that the best expert in trimming cannot detect "*the difference in the quality of the work performed by the different cutters last referred to*" (Exhibit Corthell Cutters 1, 2, 3, and Exhibit Stephenson Cutter No. 3).

Andrén, Cross-Int. 45, p. 195, record, testifies that if half the teeth were removed from Exhibit Busell Cutter (Orcutt patent of 1881), it would not affect its working at all, and he gives his reasons therefor. Such removal of teeth would, of course, nearly or quite treble the space between the teeth; yet complainants do not attempt to refute this testimony by a practical test, or, if they did, they do not report results.

See also Andrén, Cross.-Int. 54, that spaces and teeth are arranged in Orcutt's cutter just as in Exhibit Snell and Atherton Cutter; which statement complainants did not attempt to refute.

ACUTENESS OF CUTTING EDGE OF TEETH OF COMPLAINANTS' CUTTER NOT PECULIAR OR NOVEL.

Still another of complainants' "*ear-marks*" of novelty is the acuteness of the cutting edge of the teeth of their cutters. See Coleman, Int. 210, p. 77; Coy, Cross-Ints. 97, 108, 110, p. 107, 109. But Coy destroys his own theory, in that he admits, in Cross-Int. 110, that the acuteness of angles is one of "*degree*," or "*extent*," and in Cross-Ints. 112, 113, he admits that the acuteness is greater in the Exhibit Hand Tools than in Orcutt cutter; while in Cross-Int. 114 he says that the acuteness is greater in Orcutt's than in Exhibit Old Busell Cutter; so that the "*acute*" novelty consists in being greater than in some ancient cutters and less than in others. As Coy admits, in Cross-Int. 115.

That this theory is an afterthought is proved by Noble's earlier definition of Orcutt's invention (Noble, Corthell record, Ints. 20–22, p. 295, printed record). That the acuteness of edge is immaterial is proved by the Exhibit Corthell Cutters (Orcutt kind), the front of whose teeth are the reverse of hooking, and whose acuteness is thereby greatly reduced, which yet perform equally good work. It is further proved by Kingsley, Ints. 8, 9, p. 143, where he shows that the Orcutt cutters remove the leather in the form of "*dust or powder.*" Also by Eppler, Int. 18, pp. 156, who says the leather removed "*resembles a mixture of fine dust and saw-dust*"; the teeth "*scrape it off.*" And in Int. 20, he says that the overhang or rake of the teeth is "*notional with the different mechanics, one claiming that a hooking or raking cut will make smoother work than if slanted the other way, and others claiming that a scraping cut will make the smoothest work.*" And of course the more hooking, the more acute the teeth are, and *vice versa;* but practical men disagree; hence where is the utility or where the line of novelty? See also Andrén, Cross-Int. 54, p. 195, printed record, that "*the thing removed (by these cutters) is always in the form of powder or snuff.*" Cross-Int. 48, Andrén says "*its action*

(*the cutter's*) *is more like an abrasive material, such as glass or emery paper, and the particles removed are not in the form of slices, but more like powder or snuff, and therefore I think it is immaterial what inclination backward is given to the teeth; it all depends upon the pressure.* See also Andrén, Cross-Ints, 49, 50.

A THIN RAND LIP, (RAND CUTTER), NEITHER NOVEL NOR PECULIAR.

The testimony of complainants, with reference to the *very peculiar* and *very thin* lip at one side of Orcutt's cutter, is so frequently met with in the evidence of Coleman and Coy, that it is not deemed necessary to specially point out the same. But on the other hand, the following testimony of defendants on that question is referred to. Johnson, Int. 14, p. 307, printed record, states that it has been the practice to form cutters embodying the essential features of the Exhibit Brown Gear Cutter, with ridges *as high and thin* as the ridge shown at 1 in the drawings in Orcutt's patent. Int. 19, this witness says that for ten years or more, cutters similar to defendants' Exhibit Colt's Armory Cutter have been known and used. Moore, Int. 13, p. 151, says that it is not correct to say that the lip 1 of Orcutt's cutter, when placed on a Brown cutter, was a novel or peculiar feature. Int. 14, witness says that complainants' cutters are nothing but ordinary moulding cutters. Andrén, Int. 18, p. 187, gives his reasons fully why ridge 1, the rand cutter, in Orcutt's cutter, is without novelty. Int. 24, Andrén finds that the end ridges on Colt's Armory cutter No. 4, "*are if anything a little thinner than the ridge marked '1' in the Orcutt patent, coming almost, as you might say, to a knife edge, and are sharp enough to cut a piece of paper, as shown by the cuts now made by me with said cutter, in the specification of the Bigelow patent No. 88,264.*" The witness further states that "*if older, the Colt's armory cutter No. 4 would anticipate complainants' patent*"; and witness then proceeds to give fully his reason for this opinion.

That this cutter was many years older is admitted by Noble, as appears and will be shown. In this connection see also affidavit of John G. Buzzell, p. 175, printed record, an expert of extensive experience, whose testimony, both as to novelty in this respect and also as to any novelty or patentability, is clear and positive, in the negative.

FALLACY OF COMPLAINANTS' PRETENCE THAT PATENTABILITY IS SHOWN BECAUSE THEIR CUTTER IS A *LEATHER CUTTER*, WHILE BROWN'S OLDER CUTTER IS A MILLING CUTTER (A MERE DOUBLE USE).

A pet theory of complainants to prove that their cutter was novel, was that it was a *leather cutter*, and Brown's a *milling cutter;* and that theirs would trim leather, but would not mill metal; while Brown's would mill metal, but would not trim leather. The fallacy and attempted humbug of this theory, and of complainants' experiment by which they sought to establish it, and defendants' experiments to disprove it, are shown in the following cited testimony. Coleman, Cross-Ints. 50, 51, p. 35, printed record, admits that complainants' Exhibits Brown & Sharp Milling Cutters 1 and 2; defendants' Exhibits Colt's Armory Cutter and Colt's Armory Cutter No. 4, also Complainants' Exhibit Milling Cutter, embody the essential features of Brown's patent. And in answer to Cross-Int. 52, Coleman says it would not be practical to trim sole edges with either of these cutters. Cross-Ints. 72, 73, Coleman denies that the Exhibit Brown Patent Gear Cutter will trim shoes in any practical sense. In Cross-Ints. 140 to 146, Coleman denies that Colt's armory cutter No. 4 will practically mill metal; this will be shown to be important, for it will both mill metal and trim shoe soles. Cross-Int. 179, Coleman frankly admits that the exhibition of metal milled by trimming cutters would not change his opinion in the least; thus showing the intensity of his prejudice. Cross-Int. 212, Coleman states that the rake of Orcutt's cutter would prevent its

milling, but in Cross-Ints. 213–216 he admits that this effect of rake would be lost if the metal being milled was firmly held in place on the bed of the machine — a fact known to every machinist. Coy, p. 119, Int. 174, attempts to show, by an analysis of various exhibits, that milling cutters will not trim, and trimming cutters will not mill.

Orcutt, the patentee of complainants' cutter, admits, Ints. 41, 42, 44, pp. 303–4, printed record, that a cutter made like his, would, with the single exception of a thicker ridge 1, be equally adapted to cut metal or sole edges; thus clearly showing that, with the exception of the difference in thickness of rand lip, a cutter like his would be equally adapted to cut either leather or metal, and therefore the only question to be settled was, would the rand lip perform its part in milling metal. Bunnell (printed record, p. 108) states, Int. 11, Exhibit Colt's Armory Cutter was made seven or eight years ago; used it since; using it now, cutting steel double action bolt for pistol. Int. 16, defendants' Exhibit Colt's Armory Cutter No. 4, made in 1877, used on steel, on every lever made for Colt gun. Int. 18, no difficulty in milling steel with Colt's armory cutter No 4, if depth of cut is proper. Cross-Ints. 28, 31, witness explains method of cutting, and result produced by Exhibit Colt's Armory Cutter No. 4, that the coarser part is first removed by another cutter, *as is their practice;* that the cutter (No. 4) is not a strong cutter. "*Any cutter brought to so sharp a point, you have to use it very delicate, as you do the point of a small drill*"; — but does that make them any the less metal-working tools? That these cutters thus shown by Bunnell to be not only practical milling cutters, capable of milling steel, the hardest of metals, but taken right from the operative tools in use in Colt's armory, are adapted not only to trimming leather, but to trimming soles of a well-known pattern or style in a good and workmanlike manner, is abundantly shown by Corthell, Dorman, and Emery, pp. 360 to 363, printed record. And as this testimony is brief, comprehensive, and directly to the point, an attempt to abridge or brief it here would not in any degree tend to

reduce the labors of the Court; hence it is deemed the better method to refer to it as above, with the remark that no attempt is made by complainants to contradict or vary it, by any experiment whatever. Hence defendant's assume that these tests show beyond dispute that milling cutters will successfully trim sole edges.

SOLE TRIMMING CUTTERS, PRACTICAL MILLING CUTTERS.

To advance a step further, and prove that cutters strictly intended and adapted to trim soles would mill metal, defendants made repeated experiments, and always with success. Stephenson, p. 168, printed record, shows that he milled defendant's Exhibit Milled Iron Bar and Milled Composition Bolt with defendants' Exhibit Stephenson Cutters 1 and 2. The result was perfect, except in that part where the cutter was used in an old, badly worn machine; he also gives the speed of the cutter, and the time required in milling. And further, that the cutters with which this milling was done were made of "*Bessemer*" steel, inferior to first-class steel. And Corthell, Ints. 20–23, p. 137, printed record, states that he was present when Stephenson milled the iron bar and composition bolt; the cutters used to do this milling were taken from defendants' stock of trimming cutters, of the kinds most largely in stock, and not made for this trial; and after Stephenson cutter No. 3 had been used to mill No. 1 depression in the iron bar and No. 1 depression in the composition bolt, then, without change or sharpening, Corthell trimmed Exhibit Corthell Shoe No. 7; and he adds, that from its operation, he should not have known that it had ever been used on metal; thus showing that its capacity for trimming was not impaired.

Stephenson also states, Int. 13, p. 169, that he has "*seen shoe-sole trimmers employed to shape, by milling, the ends of chasing tools of hard, high quality steel, to be employed in shaping other cutters,*" "*and have done it myself.*" And in Ints. 15, 16, that he is accustomed in using or working leather, and

that there is no difficulty whatever in cutting leather by proper tools, with ordinary skill. Eppler, pp. 153–4, Ints. 4 to 7, says: Complainants' Exhibit Defendants' Cutter is practical to mill either iron, steel, or brass, as well as to cut leather; defendants' Exhibit Corthell Cutter No. 1 is equally suitable for milling metals or leather; defendants' Exhibit Stephenson Cutter No. 2 is practical for milling metals and leather; "*this has a drawing cut, and we frequently have cutters made in that way for milling iron and brass;*" that Exhibit Stephenson Cutter No. 3 is substantially like No. 2. That with defendants' Exhibit Eppler Cutter he had milled a fine piece of cast iron (defendants' Exhibit Eppler Milled Bar); that he gave it as severe a test as he should give any cutter, running it ninety revolutions per minute, with such feed as he would use in producing work of like character; that the slot was formed at one cut; that this speed and feed are the usual feed and speed in using other kinds of cutters of that size; that Exhibit Eppler Cutter, "*with the proper speed generally used on a cutter of this diameter, it will give as good satisfaction with a proper feed of the work as any cutter used to-day in machine shops.*"

This witness further states, Ints. 7, 8, that the ridge 1, in drawings of complainants' patent is not unusually high according to its thickness of base; that he has seen cutters having ridges to cut deeper than this in proportion to the thickness; seen them in D. Whittemore's factory; used to cut a groove for the knife in a "*Varney*" peg box. He further says, Int. 20, that it is notional with mechanics to make milling cutters with or without rake, some claiming that one was the best, and others preferring the other. Stevens, p. 165, printed record, Int. 9, says there is no difficulty in milling with cutters having a rake to the teeth like that in Orcutt's. Int. 12, that he has used cutters like Orcutt's, for milling "*Jessop's*" steel, taking off duplicates from cutters like plaintiff's exhibit on the face of the moulding tools. I took off about six hundred moulding tools, and they performed their work satisfactorily. Int. 13, this "*Jessop's*" steel was high quality, medium soft, having been annealed in ashes

over night only. Int. 15, the rotary cutters used to mill the Jessop's steel was Bessemer steel. Int. 16, one worth *fifteen* cents, and the other *four* cents per pound (a fair test of quality). Thus it is clear that in so far from Orcutt's cutter being incapable of milling, that when made of Bessemer steel even, that can only be hardened by "*case hardening*," it will successfully mill Jessop's high-grade steel, when rendered "*medium soft*" by annealing in ashes only.

Howell, p. 199, printed record, Ints. 3–7, shows that he milled defendants' Exhibit Howell Milled Iron Bar and Howell Milled Composition Casting with defendants' Exhibit Howell Cutter: that in milling the iron bar, the cutter made one hundred and ten revolutions per minute, and when milling the composition bar, one hundred and seventy revolutions; that in milling the iron bar, the speed was about the usual, but rather more; while in milling the composition casting, it was the usual speed; that the feed of the iron was the usual, and the composition above the usual; that he made one cut on each sample; that it is "*as good as I ever saw, as smooth as any piece of milling work I ever did*," and that Exhibit Howell Cutter is equal to ordinary cutters; in fact, any cutters that we use on milling machines, both as to quality and capacity of execution, in so far as I have tested it.

Young, Int. 8, p. 201, says the Brown & Sharpe milling cutters 1 and 2, if run at same speed, are capable of performing as good work in moulding the edges of sole leather as "*Busell Cutter*" (Orcutt patent of 1881). Int. 9, that defendants' Exhibit Young Cutter "*is properly constructed for milling metals*," that he has milled Exhibit Young's Milled Iron Bar with it, "*at the same speed and feed as that used with cutters bought of E. E. Garvin & Co., of New York, which are of similar construction to the Brown & Sharpe cutters*": that his Exhibit Milled Iron Bar is as good work as can be done on the machine it was done on, which is of light construction; the piece broken out was done fastening it in machine to mill other side.

Int. 14, severest strain to mill metal wider than cutters;

no side clearance [*defendants show both*]. Int 15, all except cut No. 1 in three first exhibits named in Int. 14, "*first class work.*"

The last and severest test made by defendants in milling metal with Orcutt cutters was made by Brown (vol. 1, p. 275); see defendants' Exhibit C. H. Brown's Milling Cutter and Milling Cutter No. 2; and C. H. Brown's Milled Steel Bar. This bar is Jessop's (English) warranted tool steel, regarded as being the best tool steel. That with the cutter made of Jessop's steel, he commenced to mill the short groove, but the arbor "*worked loose, drew out, and allowed the cutter to work towards the side of the bar, making the groove crooked, and breaking off the thin ridges from nine of the teeth.*" Then readjusted the machine, reversed the steel bar, and milled the long groove in flat side of bar with same cutter. Then with cutter No. 2, made of Bessemer steel, milled the groove in edge of steel bar; made only one cut in each groove in flat side of bar, and two cuts in edge; last one much less than one one-hundredth of inch deep. Could not run machine slower than he did (on account of its gearing), which was fifty-five feet peripheral speed of cutter per minute, or about twice as fast as it ought to be; feeding speed about two inches per minute, which was about one third above usual speed. Witness further explained that three general classes of steel are known, — "*tool steel*," the best; "*machinery steel*," second best; and "*Bessemer steel*," the poorest. He also states that there was no danger of breaking the cutters if the machine was operated as it was set to operate. Kingsley, p. 143, Int. 10, when asked whether in his opinion it would be feasible to mill metals with cutters like complainants' Exhibit Defendants' Cutter S 80, states that he sees no trouble in so using them. Witness further states, Int. 11, that defendents' Exhibit Milled Composition Bolt and Milled Iron Bar are very good work, especially the iron. He also testifies, Int. 7, that he has seen trimming done with Exhibit Stephenson Cut-

ter No. 3, and it was average work; did not know but that it was a little above average. Moore, p. 151, Int. 15, says of defendants' Exhibit Milled Composition Bolts and Milled Iron Bar, that the milling thereon is "*very good indeed.*"

DISHONESTY OF COMPLAINANTS' MILLING EXPERIMENTS.

Complainants did not attempt to disprove one of all the array of facts brought forward by defendants, to prove that the pretence of complainants, that trimming cutters would not mill metal, and that milling cutters would not trim leather, was unfounded; and the obvious reason was that it was impossible to successfully and directly attack the truth of all this array of testimony upon that point. But with an ingenuity that might excite admiration but for its dishonesty, they sought to establish their theory, by an array of honest witnesses assembled to observe their experiments, and testify to the same in entire ignorance of the attempted fraud.

I refer to the experiments in milling made at Providence, as detailed by Beale, Anthony, Phillips, Tenney, and Coleman. It is not intended to critically analyze those experiments, except in so far as a proper exposure of their actually fraudulent character may render necessary.

The exhibits in this case show two equally well-known kinds of cutters, both of which are claimed to embrace Orcutt's alleged invention, and both kinds have been put in as exhibits by complainants. The difference in these two kinds of cutters consists in this: one has teeth, which on both their front and rear faces are a right line, and hence the tooth, like that shown in Brown's patent, has strength. This form of tooth is shown neither in Orcutt's patent of '79 or '81. The other kind of cutter has the rear face of its teeth straight, but the front is a broken line, the lower part being undercut, which makes the tooth weak at the base. This form of tooth is copied exactly from the patent of '79 (*not in this suit*).

The object of such undercutting has been fully explained

under the head of rake of teeth, and its object is twofold: it saves the labor of grinding away the metal at the base of the tooth, and it facilitates complainants' method of obtaining clearance by bending back the teeth. See again Eppler, Ints. 14–19; Young, Int. 13, and others.

That teeth thus undercut are so weak as to sometimes break and fly out when trimming soles is shown by Corthell, Cross-Inst. 57, p. 218, printed record, and he states that none of that kind of cutters were used in defendants' milling experiments for that reason. See also Young, p. 202, Int. 11.

Again, complainants constantly asserted that the impossibility of milling with cutters like Orcutt's was due to the thin rand lip and the acuteness of the cutting edge of the teeth. (See Coleman, Cross-Ints. 140, 146, 180, Int. 211, and Coy, Cross-Int. 174, p. 119, printed record.) No expert thought of instancing the base of the teeth as a reason why trimming cutters would not mill; because every one knew that the strength of the base of the teeth was only a question of what the cutters were required to perform; that both kinds were well known, and defendants are here, for making the strongest kind. That these cutters are made both with and without undercut teeth is shown by referring to a few of complainants' exhibits, — complainants' Exhibit Defendants' Cutter S 80; complainants' Exhibit Defendants' Cutter (Corthell's suit), complainants' Exhibit Defendants' Cutter (this suit), and defendants' Exhibit Brown & Sharpe Slotted Cutter, made for complainants when they used the bar rand cutter. Other samples of trimming cutters, with teeth not undercut, are defendants' Exhibit Mitchell Cutter (Corthell suit) and defendants' Exhibit Eppler Cutter. In addition to the strong base teeth, attention is called to defendants' Exhibit Complainants' Catalogue, in which their cutters are represented with teeth of wide and strong base.

Samples of undercut teeth are shown, among others, in complainants' exhibits, *Exhibit Busell Cutter S* 62, *Exhibit Busell Cutter S* 65, *and Exhibit Busell Cutter S* 81.

With these facts before him, Noble went to Providence (no nearer place suited him) and there made arrangements for a test by which to prove that trimming cutters would not mill metal. He called together the witnesses named, and produced four bars of steel to be experimented upon; and these bars were the only honest part of the trial; for by comparison with any Exhibit Milling Cutter, so called, in this case, or any Brown patent milling cutter shown in the Brown & Sharpe Exhibit Catalogue, the relative height of teeth and thickness of base of the teeth of the four experimental "*Brown & Sharpe*" cutters, so called (used at Providence), are an exaggeration of strength; for no such relative proportion of base and height of teeth can be found in said catalogue, or any cutter introduced by complainants themselves; while on the other hand, the Stevens cutters, selected by Noble for that experiment, were all of the undercut kind, which defendants had already told him would sometimes break in cutting leather. That the witnesses had no knowledge of the intended cheat they were taking part in, is shown by their own testimony. See Beale, Cross-Int. 9, p. 241, who, when asked if he knew why the undercut kind of cutters were selected, said: "*I don't know why it was, because I didn't know that any distinction was made between the cutters. What I mean is, that I didn't know there was any difference in the cutters.*" See also his answer to Cross-Int. 31, showing that the cutters were selected and at the machine before he arrived to take part in the experiments.

Anthony, Cross-Int. 16, p. 246, printed record, knew no reason for the choice of Stevens cutters used in this trial; did not remember seeing any that were not undercut. Another of the guests at this entertainment was Phillips, who attended at Mr. Noble's request (Cross-Int. 7, p. 253). This witness shows, in Cross-Ints. 24–26, that the pretence of any rule or system relative to the rake of teeth in cutters, the depth of space between the teeth, and the number of teeth in cutters of same diameter, is a fallacy. Tenney, another of the witnesses, testifies, Cross-Ints. 15–19, p. 256, that if it had been stated that cutters such as the Stevens cutters used at that

experiment would not mill metal, and that cutters like Exhibit Young Cutter would mill metal, then the test *was not a fair one*. And that was precisely what complainants had been told by defendants; they had been both told and shown that cutters like Exhibit Young Cutter would mill metal, and they had been told by Corthell, Cross-Int. 57, p. 289, that cutters with undercut teeth would break in trimming leather, and would, of course, be likely to break in milling metal.

Tenney further testifies, Cross-Int. 29, that he finds none of the thin rand lips injured in either of the four Stevens cutters, except adjacent to where the teeth were broken out bodily, thus showing that if the teeth had been of suitable strength at their base, none of the rand lips would ever have been broken, as the rand lips were broken by coming in contact with the severed broken teeth (which had been hardened), and not by contact with the metal being milled. Even Coleman, zealous partisan, and fanatical even, as he is, in upholding complainants' theory, admits that "*it would be a fairer test to use a portion of each kind of cutters*" (teeth undercut and not undercut). Cross-Int. 24, p. 266, printed record.

The theory attempted to be foisted into this case by complainants is this: that if a cutter can be made that will perform an act of milling where the weakest cutters (having a sole-edge configuration) fail, then a difference between the latter and milling cutters is made out; and that if the weakest of the cutters having a sole-edge configuration can be broken in milling, where another cutter can perform the work, then such difference is proved; and that the Court will regard as honest proof a test made under conditions which complainants' own witnesses state to be unfair. It assumes that a cutter shall not be regarded as a milling cutter unless it will perform the hardest class of work, and stand any test which they may see fit to institute, while their competing cutters are of before unheard-of strength. If such theory were adopted, then Colt's armory cutter and Colt's armory cutter No. 4 would be excluded from the

class of milling cutters; although the latter are made for milling in the first armory of the world, and have been used to mill the "*top lever*" of a gun "*used on every lever that is made for the Colt gun*" (Bunnell, p. 358, Record, Int. 16), and complainants' theory would require that because these "*No.* 4 "cutters were "*not a strong cutter*," and "*you have to use it very delicate as you do the point of a small drill*" (as Bunnell states, Cross-Int. 31), that not only were light, delicate cutters not milling cutters, although made and always used for that sole purpose, but that a small drill was not a drill, because, as stated by Bunnell, you have to use it delicately. There is no more reason or justice in this theory than there would be in saying that Tom Thumb was not a man because he was a pygmy in size when compared with men of ordinary stature.

There is another fact connected with the Providence milling experiment to which attention is called. Int. 6, p. 252, Phillips fixes time of commencement of experiments at 1 P.M.; and Beale (Cross-Ints. 30, 31, p. 244) shows that the cutters were at the machine when he came; and Anthony was present at 1 P.M., as the list shows, thus showing that they were ready to begin at 1 P.M. Beale (Int. 3) shows that the feed (taking the average of the four experiments) was a fraction over two and one-quarter inches per minute, and the aggregate lineal distance milled on the four steel bars is scant three and one-third feet, or forty inches, which, at the speed testified to, would require less than eighteen minutes in which the milling itself would be done. And with the well-known rapidity with which a bar of steel, or any other simple article, can be placed in and removed from the fixture or vise on the machine, and the almost instantaneous removal of one cutter and substitution of another, and that but four pieces were milled, and but eight cutters were tried, as far as appears; where is the occasion or the reason, stated by Coleman (Cross-Int. 23, p. 265), that "*the trials were conducted by the experts, and with the results narrated by the witnesses, until near the close of the day, and until the experts were tired of proceeding further.*"

How were these five hours consumed (assuming that "*the close of the day*" meant six o'clock, when factories close; how was the milling, that could be cut in eighteen minutes, stretched into five hours, allowing due time for changes? To even an unpractised man, it would be obvious that this amount of time was never expended upon these exhibits alone; and either Coleman mistakes the facts, or there are other facts known to the other side, and not to the defendants.

OLD AND WELL-KNOWN FORMS OF BROWN CUTTERS TRIM OLD AND WELL-KNOWN STYLES OF SOLE EDGES.

Defendants assert that some forms of Brown's patent cutters, made and used tor years for milling cutters, will trim shoe soles of well-known form of edge and in good shape. This is denied in this suit by complainants, for the the first time, under their broadened "*new-light*" theory of Orcutt's invention. (See Coleman, Int. 4, p. 22; also Cross-Ints. 77, 79, 83, 84, 86, 156, 157, 158.) Where this witness, who never saw a shoe trimmed with rotary cutters but once in his life, and that when being "*coached*" for this case, testifies with unlimited confidence as to the quality of the trimming performed by Colt's armory cutters. And as a reason for such opinion, he instances the tool marks on the bottoms of some of the soles. That this supposed evidence of defective work merely shows Coleman's ignorance of what he testified to, is proved by Thompson (Ints. 35–37, p. 162, printed record), a shoemaker of thirty years' experience, who declares such marks not to be unworkmanlike; that it is common to make them with rotary cutters, and that the buffing rolls remove such marks.

That the ante-dating Colt's armory cutters will trim soles in good shape and of well-known styles or forms of edge is proved by Corthell, Dorman, and Emery (pp. 360–363), to which attention is again called. It is further shown by Corthell (Cross-Ints. 116, 119, 120, p. 327) that Exhibit Colt's

Armory Cutter has the three elements claimed by Orcutt, the rand lip, bed, and guard; and that these parts are of an outline to trim a well-known form of sole, is shown by Corthell, Dorman, and Emery, above referred to. (And that these cutters long ante-date Orcutt's patent, see Buzzell, Ints. 13–16, pp. 357–8, printed record.)

Thompson, Ints. 18, 19, 20, p. 341, confirms the fact of performing good trimming with Exhibit Colt's Armory Cutter No. 4. With the fact thus so clearly proved that no contradiction is even attempted, that rotary cutters embodying the essential features of Brown's patent, which had been in use years before Orcutt's patent, are of a form not only to trim well-known forms of shoe sole edges, but also to trim the three parts of the edge, the bed, rand, and guard; on what ground can it be claimed that Orcutt's alleged invention was not anticipated?

In this connection should be mentioned the specimen of trimming marked "*Defendants' Exhibit Draper Moulded Leather*," trimmed on its respective edges with Exhibit Complainants' Exhibit Brown & Sharpe Milling Cutters No. 1 and No. 2 (Corthell, p. 210, printed record, Ints. 2–5), which moulding is testified by Draper (Int. 29, p. 207), a trimmer of fifteen years' experience, to be "*quite smooth work*," notwithstanding it has "*shrunk out of shape some since it was done.*" This specimen of leather moulding was done by these cutters, put into the case by complainants as specific milling cutters, and it shows just what both Noble and Orcutt testified to in the Corthell suit (already quoted), that with the exception of the peripheral configuration, there is no actual difference between Orcutt's cutters and Brown's patent cutters. And if, as already shown, some of the Brown patent cutters, which were old before Orcutt's alleged invention, will trim *some* of the old and well-known forms of shoe edges, how could Orcutt obtain a valid patent for a cutter having any other old and well-known form?

EXHIBIT STEPHENSON MOULDED CUTTER, AND OTHER CITED FACTS.

Attention is here also called to defendants' Exhibit Stephenson Moulding Cutter, made by Stephenson years before Orcutt's alleged invention, for making wooden patterns for castings for window mouldings, (Stephenson, pp. 163-4); it was used for a year and a half, and was then superseded for that purpose, by rotary moulding machines.

That this cutter possesses the elements specified in Orcutt's first claim is obvious at a glance; and that it is susceptible of use as a sole trimmer is shown by Exhibit Thompson Shoe No. 2, which was trimmed by it (Thompson, p. 161, Ints. 21, 22). This cutter has detachable teeth; so did Orcutt's; it has a moulded top and flat front face to the teeth like Orcutt's; and it shows incontestibly that the idea was old to make such cutters for uses other than moulding iron, and the evidence it furnishes is in exact accord with Buzzell, p. 175, that there could be no invention in the Orcutt cutter at the date of his alleged invention in view of the well-known state of the art at that time, as stated by Buzzell; which view is further confirmed by defendants' Exhibit Corthell Moulded Board, Int. 6, p. 211, which was moulded by divers cutters, all but one of which, complainants insist, are trimming cutters, but which are equally as available for wood moulding as is Exhibit Stephenson Moulding Cutter, or the cutters mentioned by Buzzell. And showing that a cutter suitable for moulding wood, leather, or metal, is adapted and suitable for moulding each and all of the others of such materials.

That Orcutt's cutters are identical in their operation upon wood, with other wood moulding cutters, is clear from Kingsley's evidence (p. 144, Int. 12), who shows that the best method of copying the form of cutters, on burnishing irons, is to mould a piece of wood with them, to serve as a pattern.

It is also shown by Young, p. 201, Ints. 5, 6, that the idea of moulded rotary cutters was a common idea before Orcutt's alleged invention; for Bigelow, since deceased, had such a cutter in 1877, made with a series of teeth like that in Ex-

hibit Bigelow Cutter, arranged round the periphery, thus showing that such idea was old, common, and well known, and required no inventive faculty for its production. This rotary Bigelow cutter had removable blades, and so had Orcutt's patent cutter, and hence no argument of dissimilarity as between Bigelow's and complainants' cutters can be urged on that score, and the same is true with reference to Stephensons' Exhibit Moulding Cutter.

MODEST OBJECTION OF COMPLAINANTS AGAINST CORTHELL'S PATENT CUTTER, AS A REFERENCE.

Complainants have advanced the modest theory that Corthell's Exhibit Patent Cutter, made under his patent of 1878, ought not to be regarded as a reference or answer to their patent, because it is "*expensive*" and "*complicated.*" See Coleman, Int. 7, p. 26, who describes it as "*complicated*" and "*difficult to make, as each tooth was separately formed, and lips had to be cut to fit into slots which had to be made in the cylindrical hub in which they were placed.*" This objectionable feature differed from Orcutt's invention only in that Orcutt required *two* such *hubs*, while Corthell required but one (see Orcutt's sworn statement of his invention in copy of file wrapper and contents). Noble, p. 129, admits that Corthell's cutter trimmed the rand, bed, and guard (all the parts that Orcutt claimed), but that it was so much more *expensive* to make than Orcutt's. In view of the fact that *their* cutter was worthless as presented to the Patent Office and the public, as admitted by Noble, p. 268, printed record, where he says, "*The cutters with inserted blades . . . were too expensive*," it would seem to require a degree of audacity, challenging admiration, for them to decry a reference, because it showed a cutter made exactly like theirs in the respect in which they attack such reference.

ORCUTT PRODUCES NO NEW PRODUCT, RESULT, OR PRACTICE.

That Orcutt produced no new product whatever by his cutter is shown most clearly by Coy, Cross-Int. 96, p. 107; Corthell, Int. 5, p. 361; and Martland, p. 345, Int. 29; as also much other testimony.

This fact is emphasized by comparison of defendants' Exhibit Complainants' Catalogue, with defendants' Exhibit Snell & Atherton Catalogue, which, as Martland says (Int. 16, p. 344), was circulated in all civilized countries, and from which complainants copy their forms of cutters as depicted in their own catalogue. It is further emphasized by the fact that Noble went to Snell & Atherton's to get "*a pint or more of worn-out cutters of edge planes to be used in producing facsimiles thereof in their own cutters.*" (Dunham, p. 350, Int. 6.) The further pertinent fact is cited, that before Orcutt's invention it was common to trim all parts of the sole with a moulded edge. See Corthell, pp. 137–40, Ints. 24–27; showing that both the Bolling and old Busell rotary cutters trimmed all parts of the sole with a moulded edge, of which Exhibit Mitchell Boot is one of the forms and a sample. In addition to this, we have the testimony of Noble, Cross-Int. 30, p. 296, that the Coté cutter trimmed both a straight and a concave sole; and on p. 125, printed record, he admits that the old Busell cutter trimmed three styles, the "*straight*," "*medium concave*," and "*full concave;*" and if the "*straight*" soles are "*plain soles*," then, as testified by Corthell, the "*concave*" soles are moulded soles; and if Thompson's cutter, in the form then made, could mould two forms of edges, it could not be new to mould, with a rotary cutter, other well-known forms. Kingsley, p. 145, Int. 18, testified that the Mitchell Exhibit Boot is one of the well-known styles of moulded edges.

UNFOUNDED PRETENCE THAT COMPLAINANTS' CUTTER HAS EFFECTED A REVOLUTION IN THE ART.

The attention of the Court is called to complainants' pretence, that their cutter has wrought a revolution in the sole-trimming art; which pretence is voiced by Coleman (Int. 3, p. 17), where, after having, in the intensity of his ignorance of this art (having but once ever seen a rotary cutter in operation, and then in the process of cramming for this suit), he recites a long list of patents, among which are the Exhibit Bolling Patent (that trimmed straight and concave) and the Exhibit Old Busell (that trimmed all parts in three styles), and then declares that "*all this ingenuity, effort, and expense had not succeeded in producing a machine tool which could successfully compete with the old hand tool.*" This statement is false in fact, though no doubt not in intent; the witness was testifying as he had been "*primed.*" But in fact the old hand tool was then in use, just as it now is; and rotary cutters had been for years in successful use before Orcutt's alleged invention, and the same cutters are still in use; and we might simply point to complainants' Exhibit Catalogue to prove the fact. But as this position is evidently regarded by complainants as of great force, we ask the patience of the Court while we present the facts in detail. Noble (p. 124, printed record) says: "*The progress of invention of rotary cutters for sole edges has been gradual.*" He further states, Int. 9, p. 293, that since 1875 (four years before Orcutt's alleged invention), his main business has been "*the developing the art of trimming soles with machinery.*" While in answer to Ints. 15, 16, 17, p. 295, printed record, Noble states that with the other cutters known before Orcutt's they could trim the common, coarser work *four times as fast* as by hand, and with the Orcutt they could trim "*about the same number of pairs per day,*" but made better edges; thus annihilating Coleman's above-quoted statement.

On p. 122, printed record, Noble says, "*the machines in*

use in 1875 *were mainly of the kind called the Coté machine, but only to a limited extent; think less than seventy-five.*" "*A few Hodges machines, so called, were put out prior to* 1875"; and "*a few Tayman machines, so called, were put out before* 1875, *and were used several years, but not more than seventy-five were ever in practical use;*" "*Of these the Coté and Hodges used rotary cutters.*" Page 123, Noble states that "*the next cutter in order of time, and the best cutter of its day, was the cutter patented in* 1874, *No.* 157,476, *by J. C. Knights.*" This cutter was used in the Coté machine, and hence is called the Coté cutter. This cutter would make not only a plain edge, but also a concave edge, and was much more easily sharpened and did better work than any prior cutter. It superseded the burr cutter entirely, *and was in general use* on the Coté machine from *1874* till about 1877, when it was modified and greatly improved by making the blades separate from the hub, as in the cutter marked "*Exhibit Old Busell Cutter,*" which was patented by Busell in 1878, No. 210,006.

This latter cutter is the one still carried in complainants' catalogue, and testified about by Draper and Pebbles. See also balance of Noble's statements on p. 123, as to facts connected with this business, before Orcutt. Noble further states, p. 130–1, that "*the Knights cutter, with the rand knife and the toothed sleeve, was largely used at and before the time when the Orcutt cutter was put upon the market, and was indeed the standard cutter of the Busell Trimmer Company,*" thus showing that they had a "*standard*" rotary cutter before Orcutt's. Noble states, on p. 129, after enumerating the various earlier cutters, that "*Orcutt's cutter came into the market and superseded them all.*" This statement is absolutely disposed of by reference to defendants' Exhibit Complainants' Catalogue, and Corthell, p. 212–13, Ints. 12, 19, showing that the Busell cutter and coacting parts figure conspicuously to this day in their catalogues.

It is further shown by Noble, p. 131, item 16, that the Hodges rotary cutter, patented in 1864, was used till superseded by Knights cutter and old Busell cutter, the Busell

cutter being patented in 1877, the Knights cutter being patented in 1874.

It is also clear from Noble's statement, on page 123, printed record, that "*during the years* 1874, 1875, 1876, 1877, 1878, *and the fore part of* 1879," there was a regularly established business of sole trimming with rotary cutters, and as Noble there says, "*practically all the shoes whose soles were trimmed by rotary cutters in this country were trimmed with the Knights cutter, by which I mean to include both styles, Exhibit Coté Cutter Knights Patent and old Busell Cutter.*"

Noble concludes by the assertion, page 132, "*the enormous increase in the rotary trimming business since the middle of* 1879, *is due wholly to Orcutt's invention, and that the sole reason for the smallness of that business up to the middle of* 1879 *was the fact that no rotary cutter for sole edges was then in the market with a rand lip, a bed, and a guard.*" Whether Orcutt's cutter has done all that is above claimed, is shown by the following facts: Corthell, p. 316, Int. 34, printed record, shows the difficulties in the earlier stages of introducing rotary cutters; Ints. 50, 51, p. 318, that this enterprise was delayed by the threats of D. Whittemore, which closed up the Excelsior Company, and then his patents went to the complainants; Leavitt, Int. 3, printed record, shows that Whittemore and complainants consolidated in 1877; and Leavitt, p. 273, printed record, carries the making of Coté machines back to 1873, and on that page he reiterates the story of the consolidation by Whittemore and complainants. Cross-Int. 24, Leavitt shows that the Brown patent, generally known as the Brown & Sharpe patent, was one of the lions in the path of progress. And this fact is incontestably shown by Noble, p. 126, printed record, where he says, "*I also believed that the cutter described in the patent in the suit infringed that patent* (*Brown's*), *and therefore took a license under it, which remained in force until that patent expired.*"

And while on the subject of licenses, attention is called to the compact between Orcutt and his co-complainants (p. 13,

printed record), which shows that the Busell company, when taking a license under Orcutt's patent, was very careful to exempt itself from liability of royalty on all cutters thereafter made "*in accordance with the terms of the patent granted to James C. Busell on the nineteenth day of November, A.D.* 1878." And it was well for them that they did, for, as already stated, this cutter still shows conspicuous on the pages of their catalogue. This license, be it remembered, was executed Jan. 21, 1880, six months after Noble had seen Orcutt's cutter, which, he testifies, satisfied him that it was to be *the* cutter. Corthell, Int. 8, p. 135, printed record, states that the Knights cutter was used from 1875, and are used up to the present time; "*were used on two hundred or more machines.*" Int. 10, he states that "*the cutter marked 'Complainants' Exhibit Old Busell Cutter,' was used very extensively, and is used at the present time.*" Int. 13, "*the exhibit marked 'Complainants' Exhibit Orcutt Cutter, First Style,' I have never seen used.*" This is the inserted tooth cutter like Orcutt's patent, and no one pretends that it ever went into use. In Ints. 17, 17*b*, 18, and 19, Corthell shows one of the schemes of complainants for controlling and "*booming*" the Orcutt cutter; this was to insert a rand cutter across its face, like the Busell patent cutter, which they discarded as soon as they obtained the Orcutt patent. It was put in to make believe that it was essential, and Noble then refused to make cutters without it, because, as he said, "*the Busell Company had a solid patent on that feature.*"

As showing that any or all the rotary cutters have not monopolized edge finishing, attention is called to Corthell's statement, Cross-Int. 37, p. 142, printed record, where he expresses the opinion that "*one-half of the edges now in the boots and shoes that are manufactured are trimmed by rotary cutters.*" The decrease in making edges by hand plane would be rather more, on account of the draw-cut machine trimmers. Much of the inside history (uncontradicted) of the means resorted to in pushing Orcutt's cutter into use is shown in Corthell's answers to Cross-Int. 50, p. 217, printed record, which shows that complainants have bought up all the patents for

rotary trimmer cutters and rotary rand knives, and owing to the "*immense profits*" on Orcutt's cutter, "*formed a monopoly*," and made the manufacturers "*believe that is the best cutter for them to use.*" Cross-Int. 52, p. 217, Corthell is asked why defendants don't make the Thompson rand and sole edge cutter, and he gives the pertinent answer that it is for the same reason that complainants don't; there is a bigger profit on the cutters in suit, when sold at three dollars; and besides, many machines now in use "*would have to change all over.*" And in Int. 58, p. 218, Corthell shows that earlier and other shoe machinery exerted a material effect in the matter of introducing machine trimming; that many manufacturers would not adopt rotary trimmers at first, because, in order to make them profitable, "*they have first to reorganize and introduce other machinery.*" And he cites various factories where to-day, although using steam power and other machinery, they will not use power trimmers, although some of them have tried them, but adhere to hand trimming; the reason being that "*their variety of styles is so numerous.*" Referring to the question of enormous profits on Orcutt's cutter, which have stimulated the complainant company to push it, Noble kindly shows, pp. 123–4, that to the inception of this suit, Orcutt's cutter had always sold at three dollars; while under competition the price is reduced to one dollar (Cunningham, Int. 2, p. 210). And as it appears from Orcutt's license to complainant company (p. 12, printed record) that Orcutt receives the munificent sum of *twenty-five* cents per cutter, it requires no great strain of arithemetic to discover that with this monopoly in full blast, the inventor received a "*quarter*" on each cutter, while the Busell company received seven times that sum, which two dollars was paid by the trade on every cutter, over and above a fair profit, until changed by wholesome competition. Hence to restore this monopoly, and taking Orcutt's figures, on p. 165, vol. 1, as to number of cutters heretofore made, and estimating the increase of population and the duration of the patent, it is easy to perceive that such undue profit would reach well up to a *million of dollars.*

Kingsley, p. 145, Ints. 19, 24, expresses the opinion that since 1880 trimming with rotary cutters has doubled; and in Ints. 20, 21, 22, he states that hand trimming has decreased about one-half; thus showing that the hand trimming has not been superseded. Thompson, Int. 9, p. 159, printed record, identified eleven parts of old Busell cutter, as illustrated in complainants' Exhibit Catalogue, thus showing that Orcutt's revolution is yet in abeyance. This witness shows, Int. 26, that Orcutt's cutter has no advantage over the Exhibit Thompson Sole and Rand Edge Trimmer, except the bead, which is no part of complainants' patent. Ints. 27–31, witness shows that the Thompson cutter was used with a bead; that by setting the gauge, the sole was reduced to a uniform thickness, and performed all that Orcutt's does; and in Int. 32 he shows, as Kingsley and Corthell have shown, that the Exhibit Thompson Edge Trimmer formed a moulded edge, which complainants have claimed as the product of their cutter only. Int. 33, Thompson testifies that with the Exhibit Thompson Trimmer he has done "*first-class trimming on first-class work*" at M. C. Dizer's, East Weymouth.

That these Orcutt cutters have not swept all before them, as asserted by complainants, is further shown by Pebbles, vol. 1, p. 203, printed record, a manufacturer of thirty-three years' experience, who has twice tried them, with results so far from satisfactory, that in each case he has gone back and is still back on the old Busell cutter, which he buys new, or has rebladed for one dollar each, which latter fact confirms Corthell's statement that the profits on Orcutt's cutter at $3 was enormous; for it is obvious that the old Busell is the more costly of the two, else why not make Orcutt's like his patent, with inserted teeth?

Draper, p. 204, printed record, an operator on rotary trimmers, with eleven years' experience (showing that he started in 1874), in his first eight answers, states that complainants' Exhibit Coté Cutter (Knights patent) was the first he used; at E. Mann's, Milford, "*they did good work*"; he also states a number of other places where he used the

same cutter, among which was E. & A. H. Batcheller & Co.'s, North Brookfield; that in 1877 Batcheller & Co. had fifteen machines using this kind of cutter. Int. 9, witness says he was working for D. Whittemore (him who sold out his patents and consolidated with complainant company, as before stated); that he (witness) went to Batcheller about selling him trimmers; asked me if I could trim as well as his hand work; told him I could, better; shipped a machine to his factory at North Brookfield; set it up and got to work; *trimmed all kinds* of the boots and shoes they were making to his (Batcheller's) perfect satisfaction; and that day received an order from him for fifteen sets of machines ($7,500). Int. 10: Trimmed *sixty* pairs of brogans in eight minutes, as he (Batcheller) said; he held the watch. He was perfectly satisfied, and in about a month hired me to take charge of his trimming, heeling, and edge setting, and I remained with him five years. Int. 11: These machines save two cents per pair. Int. 12: While I was there they made from six thousand to ten thousand pairs per day (which would be a saving of from $120 to $200 per day, if, as "*Gil Blas*" says, "*there is any truth in arithmetic*"). Ints. 13, 14, 15: In about a year changed from Coté cutter to old Busell cutter which took out the rand; used these all the time I was there. Int. 25: Worked for Claflin, Coburn, & Co. from 1882 to 1884; had charge of their bottoming department, at Framingham factory. Int. 28: They made from eighteen hundred to twenty-four hundred pairs per day. Int. 26: The Busell cutter, this one [*referring to complainants' Exhibit Old Busell Cutter*] was used on three-quarters of their work. The balance was trimmed with a rotary plane. Int. 27: Do you think the number of shoe soles now trimmed by rotary cutters has been increased by introduction of Orcutt's cutter, "*over and above what would have been so trimmed had the 'old Busell cutter' remained the only cutter in use.*" Ans. "No, sir; I don't think it has."

And in conclusion, it is respectfully submitted that the testimony under this head shows that so far from Orcutt's cutter having, cyclone like, swept all other means and methods out

of existence; that it has crept into existence by the means so pointedly described by the Court in the well-known "*Mop-Head*" suit; "*superior facilities*," "*fortuitous circumstances*," and further, the desire for enormous profits, have all tended to push it forward.

COMPLAINANT'S FALSE STATEMENT OF DECISIONS OF THE CIRCUIT COURT, CONCERNING THE MATTER IN SUIT.

And in this connection attention is called to page 32, of complainants' Exhibit Catalogue, where they parade about fifty (50) obsolete *brumagem* patents, as a legal scarecrow to intimidate others, not posted, from entering into competition in this business; and lest these emblements of title to the art should fail to inspire a due degree of awe, they reenforce them with the announcement, p. 3 of their catalogue, that, "*At the present time we own and control over fifty patents, which have been fortified by decisions favorable to the company in every suit we have ever commenced against infringers.*" The modesty, truth, and candor of these statements, and their evident use for bulldozing the public, is apparent when it is considered that of all the suits they have ever brought, but two hearings, "*Keith*", and this suit, had then taken place; both of which were "*preliminary*" and "*denied*"; and that every "*decision*" in their favor was a decree only, purchased by them as a compromise, effected by Noble, by hiring away these defendants from the Corthell company; *they* had a perfect right to leave that company; of Noble's conduct in that matter the Court can decide. They continue, on page *3*, catalogue: "*These patents so thoroughly control the edge-trimming business that any parties selling or using machines or cutters substantially as shown in cuts on pages 17, 18, and combining the welt cutter and bed in one cutter, are direct infringers of our patents, and will be held liable to the full extent of the law.*" That this last statement is absolutely false, complainants well know, for the Keith suit was fought on the exact line of a rotary rand cutter with a bed cutter; and after the preliminary hearing, they aban-

doned such ground, as their present counsel know, for they were of counsel for complainant in that suit. Hence it is obvious that all such statements were put out for the purpose of misleading and deterring the public from entering into this field; and that from such result complainants may assert, as did their witness-in-chief Coleman, that no cutter before Orcutt's could successfully compete with hand trimming. Another of complainants' tricks in misleading the public and bolstering a monopoly has been, and still is, to parade a long list of patents upon each machine, by marking the same thereon; when, in fact, the Orcutt patent is the only one on which they dare bring a suit, and only on this when the defendants cannot be bought off, or driven as others have been. See Corthell, Int. 13, p. 212, printed record.

REASONS WHY ORCUTT'S CUTTER HAS BEEN SOLD AT AN EXORBITANT PRICE.

At first view it might seem peculiar that the price as between the Orcutt cutter and the old Busell cutter should have such variance; but the answer, upon reflection, is obvious. In this art, where the patents range all the way back to 1853 (see Thompson's patent No. 10,230, 1853), and which has been growing for years and years, there can now be no practical monopoly on any cutter attempted to be secured by such earlier patents. This is shown by complainants' former suits; they sued Eddy & Co. on eight patents; then they dropped to *one* patent — Tayman's — in the Keith and White suits (see Eddy, p. 173); and discovering, by the array of defendants' testimony in that suit, that there could be no monopoly on cutters under any patent then in force, the then pending Orcutt application was totally changed, with the hope that thereby they could "*corner*" and monopolize the shoe-trimming art. And knowing long ago that the earlier patents were of no avail, they charged reasonable prices therefor; but assuming that it was now or never, as to enormous profits, they charged for the Orcutt cutter three times the price of the old Busell cutter.

VAGUENESS AND UNCERTAINTY OF COMPLAINANTS' THEORIES TO PROVE NOVELTY.

With all of complainants' assumptions of a material, radical, and positive difference between their cutter and Brown's, in its endless variety of peripheral forms, they totally fail, as does their patent, to point out, with any such definiteness as the law requires, any such line of demarcation between the two cutters. As already quoted, Coleman could not tell what was the rake of teeth in their patent. He only deals in the most diffusive and ridiculous theories, and totally fails to state any facts that enable the Court to decide wherein such difference exists, except the bold and oft-repeated declaration that it does exist. Coy, their expert, when asked, Cross-Ints. 141, 142, p. 113, printed record, if the acuteness of angle of the top and front face of the teeth could be varied without impairing their efficiency, replied that they could; but when asked, in the next interrogatory, to what extent, he admits that it can only be demonstrated by experiment, thus showing that there is no rule therefor; and yet this is *now* claimed to be one of the cardinal points in their cutter, and it is as definite as anything claimed, since Orcutt testified.

In Cross-Ints. 154, 157, Coy shows that the matter of the number of the teeth or their distance apart is entirely vague, uncertain, and a matter of guesswork. In Cross-Int. 171, Coy further admits that he does not find in Orcutt's patent any special angle for the front face of the teeth; and in Cross-Int. 172, he admits that he cannot tell, by comparing Orcutt's patent with complainants' cutter, whether the eccentric form of the top of the teeth is alike or unlike in the two. And in Cross-Int. 158, this witness fully describes the entire absence of any rule by which Orcutt's cutter is or may be proportioned, except another string of indefinite theories, all of which have been disproved by defendants' experiments.

Noble, p. 126, printed record, does give a definite rule for proportioning the parts of the teeth of Orcutt's cutter; and it is simply to make them by the same rules as the old hand tools.

And this admission by Noble — complainants' general manager — is so conclusive as to the identity of the cutter in suit, and the old hand plane, that it is quoted, as follows: "*As the style of the sole edge depends wholly upon the relation between the lip, the bed, and the guard, and the size of these parts, there must obviously be the same rules as to proportions of the lip, bed, and guard, and also as to the bead and channel guard when used, applied to the rotary cutter as are applied to the hand plane, and Orcutt is the first, so far as I know or have reason to believe, who ever made a rotary cutter by applying these rules.*" A most frank admission that Orcutt has simply *aggregated* in his cutter the old idea of a rotary cutter, with the teeth of the old hand plane.

And if, as stated by Phillips, complainants' expert, Cross-Ints. 24, 26, pp. 224–5, printed record, there is no fixed rule for the angle of the front of the teeth, the spaces between the teeth or number of teeth in cutters of given diameter, — and complainants have shown no such rule, — how can it be claimed with any consistency that there is any rule on the subject by which one cutter is distinguished from another? for if there can be no rule in the matter of cutters for metal, there can be no distinguishing rule between them and other cutters.

COMPARISON OF EXPERIENCE AND THEORIES OF COMPLAINANTS' AND DEFENDANTS' WITNESSES, ESPECIALLY COLEMAN'S.

Having gone over the testimony of the witnesses in relation to the various points raised by complainants, attention is called to the relative experience and standpoints of the respective witnesses of the parties.

Johnson, p. 305, called by defendants as an expert in relation to cutters, is a patentee of some half dozen patents, and a machinist of twenty-two years' experience in the first-class establishments of the country, as his list shows.

Mann, p. 331, called by defendants as an expert on shoe

tools; engaged for forty-three years making such tools. Jones, p. 337, called by defendants as an expert in matter of sole trimming with rotary cutters, and that Orcutt's cutter would not remove the rand; worked at trimming with rotary cutters three years. Thompson, pp. 158 and 340, a shoemaker of thirty years' experience, and familiar with the various rotary cutters.

Martland, p. 342, shoe-tool maker of twenty-nine years' experience, called, like Mann, to testify in relation to the method of making the hand planes, and their similarity to the Orcutt cutter, and methods of making the same.

Dunham, p. 349, patentee of Exhibit Dunham Edge Cutter, called to prove Noble's excursion to Snell & Atherton's for the "*pint or more*" of hand plane cutters to be used as duplicates in making Orcutt's cutters, and other facts.

Crisp, p. 350, same record, called as an expert, in comparison of Orcutt's cutter with Exhibits Hand Planes and Brown Patent Cutter; twenty years' experience as a machinist; ten years as an expert in patent causes, and familiar "*with all classes of cutters.*"

Mitchell, machinist, p. 354, was not asked by either party as to his experience; but he showed by his Exhibit Cutter and his testimony that it required neither invention nor shoemaking knowledge to make, at the first trial, a cutter exactly like Orcutt's, although he had no experience, except with milling cutters.

Bunnell, p. 356, a tool-maker and contractor of twenty-seven years' experience at Colt's armory; called to identify old Brown milling cutters used at Colt's armory, to show their long use and to compare same with Orcutt's.

Dorman, p. 362, shoe manufacturer for eighteen years; called to prove that the shoes trimmed by Corthell with Colt's milling cutters were of a well-known style and well trimmed.

Emery, p. 362, edge trimming machine operator for fifteen months; called as to quality of trimming done by Corthell with Colt's armory milling cutters.

Corthell, one of the defendants, commenced at shoemaking

over thirty years ago; worked at it till the beginning of the war; after the war, worked in various shoe factories; then with D. Whittemore, selling, setting up, operating, and instructing others in use of rotary trimmers and setters; been in shoemaking line ever since; invented and patented divers shoe machinery, pp. 133, 210, 311, and 360; called as an expert on state of art and comparison and use of cutters.

Kingsley, p. 142, machinist the past twelve years; formerly shoemaker; called as an expert of thirty years' experience as to use of hand tools and other facts.

Miles, p. 147, twenty years a hand trimmer, and six years a trimmer with rotary cutters; called to prove that defendants' Exhibit Mitchell Boot has moulded edge, and the operation of Orcutt's cutter.

Moore, p. 149, in machinist business for himself twenty-five years; called to show that Orcutt's cutters are entirely adapted to mill metal in a practical manner, and the quality of milling performed by them, with other important facts.

Eppler, p. 153, machinist; fourteen years' experience in shoe machinery; twenty-three years' experience in milling cutters, gunwork, patent vises, and brass work; called to prove that Orcutt's cutters are adapted to mill metal, and generally in regard to Orcutt's and other rotary cutters.

Stephenson, pp. 163 and 168, a machinist of twenty-two years' experience; used, among other branches, to making shoe machinery and tools; called as an expert on milling, and to show state of art in matter of rotary cutters.

Eddy, p. 173, manufacturer and dealer in shoe machinery; called as a *very experienced* expert, to show complainants' peculiar methods of bringing, conducting, and compromising suits upon their patents.

Buzzell, p. 175, manufacturer and dealer in shoe machinery for fifteen years; previously engaged in using and operating other machinery involving the extensive use of rotary cutters; patentee of a dozen inventions, large part of which for sole-finishing machines; called to show state of art before Orcutt's alleged invention, and to express an opinion as to whether Orcutt had invented anything patentable.

Andrén, p. 181, a trained mechanic and scientific scholar; extensive experience in practical mechanics and as an expert in patent causes; called to compare Orcutt's cutters with hand planes and other earlier trimming tools, and to express an opinion as to novelty of Orcutt's invention, with other facts.

Howell, p. 199, machinist of seven years' experience; called to test capacity of Orcutt's cutters to mill metals. See his exhibits, p. 199.

Young, p. 200, a machine tool builder since 1877, manufacturer of Exhibit Bigelow Cutter since 1878; called as an expert on question of milling metal with Orcutt's cutter, use of other cutters and state of the art.

Pebbles, p. 203, shoe manufacturer for thirty-three years; called to prove the continued and preferred use of old Busell cutters.

Draper, p. 204, expert with rotary trimmers; eleven years' experience; called to show early, extensive, continued, and successful use of Coté and old Busell cutters, and other facts pertaining to the art.

Brown, p. 207, machinist for twenty-two years; called to prove that Orcutt's cutters will mill highest grade of tool steel at usual feed and speed.

On the other hand, complainants introduced the following witnesses: —

Parks, p. 288, an experienced machinist and cutter maker, whose testimony is very fair on the whole, and very much to defendants' benefit, especially his answer to Ints. 10, 11, 12, and Cross-Int. 15, to which attention is again called.

Noble, pp. 122, 267, and 292, who was introduced, among other purposes, to prove that Orcutt's cutter was the first and only successful cutter to remove the rand while trimming the bed.

As regards the other qualifications and objects of this witness, they will be enumerated under other points.

Orcutt, p. 299, record: the inventor and patentee of com-

plainants' cutter, much of whose testimony has been approvingly quoted for defendants.

Coleman, pp. 16 and 260, who, although he is brought here to give an exhaustive review and lecture upon the entire history of the art of sole trimming with rotary cutters, and to analyze all the inventions and patents pertaining thereto, which ante-date Orcutt's; starting at 1853, as appears by his answers to the seven direct interrogatories; yet, as appears by his answers to Cross-Ints. 32, 33, 34, 35, 36, 37, and 138, was never before called as an expert in patent causes in relation to "*shoe machinery of any kind.*" Never "*concerned in designing, preparing drawings for, manufacturing, selling, putting in operation, or running any boot or shoe manufacturing machines.*" Never but once witnessed the operation of trimming soles with rotary cutters, and that with Mr. Noble and Mr. Maynadier; and to his knowledge never saw a shoe trimmed with any rotary cutter except Orcutt's. A witness who believes and testifies to novelty in Orcutt's cutter, upon the theory that a new "*use*" is novelty, as appears by his answers to Cross-Ints. 54, 80, 81, 82, 147, 148, 149, 156, 158, 159, vol. 1. A witness who believes that if Orcutt had invented his identical cutter for the purpose of milling metal, and it had been so used till now; and that now some one should conceive the idea of using it for trimming shoe soles, that such latter person would be entitled to a patent therefor. See his answer to Cross-Ints. 147, 148, p. 61, printed record, which are direct and positive on this point. And a witness who, in all his testimony, labors under similar misleading instructions or delusions; and that he knew nothing of the art about which he testified is shown by the comparison, already instituted, between his statement in Int. 3 (where he asserts that up to Orcutt's invention, a machine tool which could successfully compete with the old hand tool had not been produced), and the admissions of Noble and the testimony of others of the still continued use of earlier machine cutters.

Coy, p. 89, another of complainants' experts, is conspicu-

ons by his entire ignorance of the practical use of Orcutt's cutter; Cross-Int. 99, had never seen it in operation on shoe soles; Cross-Int. 100, never had its operation fully described to him; had "*entered into conversation with different persons in relation to the novelties of different kinds of cutters.*" Cross-Int. 101, shows that Messrs. Maynadier and Noble had performed part of the duty of so enlightening him. Cross-Int. 104, had secretly tried Orcutt's cutter on strips of leather and wood. This witness did not know enough of the art to be sure that other cutters than Orcutt's were now in use, Cross-Int. 16; but if so, must be used on poor work.

Cross-Int. 19, 20, thinks if old Busell cutter is still in use, it is due to the "*ignorance*" of manufacturers, and want of skill on the part of operators. That this witness had had some experience in rotary cutters is shown by Cross-Int. 85, where it appears that he once ran an old Busell cutter at Syracuse, and another cutter, of kind unknown to him, at Rochester, N.Y. It is submitted that these witnesses were designedly selected for their lack of practical knowledge in this art, for the very reason that they were in the condition of "*exhausted receivers,*" and could be readily placed in that mental condition so aptly described by General Grant in his memoirs, where he says: "*The most confident critics are generally those who know the least about the matter criticised.*" And the office of an expert is largely one of criticism. That Coleman had had large experience in certain matters is not denied; but it is submitted that his experience in an establishment like that of Corliss, for construction of the most ponderous machinery; the study of patents in the museums of Europe; the manufacture of ship chandlery and hardware; the mining of silver in Idaho; the traffic in Harrison boilers; an agency among the war departments of Europe; heating cities by steam; inventing a horseshoe nail machine, or providing facilities for draining the dominions of the Khedive of Egypt, are not specially adapted to qualify the witness in the intricate details of an art like this; and especially so, when the witness is introduced to rehearse and elucidate the art from 1853 (date of Thompson patent recited by witness) to the date of complainants' patent.

COMPLAINANTS' USUAL TACTICS IN SECURING LEAVITT AS A WITNESS.

Leavitt, another of complainants' witnesses in this suit, was a former witness for defendants in the Corthell suit (see p. 273, printed record), but has been transferred to complainants' side by the usual and peculiar tactics of complainants. Leavitt testified in the Corthell suit, Sept. 8, 1882; since then has had contracts with complainants' company. Cross-Int. 6, never had a contract, or done work for them, before giving that deposition for defendants; about two years, as near as he could remember, after giving that deposition, before he had contracts with complainant. Has continued to work for complainant since.

It was one year and eight months from the time of giving the Corthell deposition to the date of testifying for complainants, which is within four months of Leavitt's "*two years*" between the Corthell deposition and being employed for the *first time* by complainants; and if we make the same discount in his time that is requisite to his answer to Cross-Int. 2, which is one fourth (for it was *three*, and not *four*, years as he there stated), it will be readily seen that when this suit became imminent, then complainants saw that Leavitt required looking after, as he was an important witness, and had testified in the Corthell suit on the question of who first invented the Orcutt cutter; and hence James H. Busell, on whose patents complainant company was first based, whose name it bears, and who went to Snell & Atherton's to get a hand plane, and information how they were made (Martland, Ints. 21, 22, p. 344, printed record), was despatched to negotiate with Leavitt; (see Leavitt, Cross-Int. 10). A slight variation on complainants' tactics on the Corthell suit, when seeking to break up the business of the Corthell company.

PECULIAR THEORIES OF COMPLAINANTS' EXPERT COY, BY WHICH TO ESTABLISH NOVELTY IN ORCUTT'S ALLEGED INVENTION.

It is not matter of surprise that a witness like Coy, testifying from his standpoint, should insist that the rand lip in Orcutt's cutter, being made an integral part of the tooth, thereby constitutes one of the features of its novelty. And yet when asked if a cutter was made in three parts, to cut a path like complainants' cutter, would it be substantially like it, answers, yes, I think it would (Cross-Ints. 116, 117, 118, p. 110). Thus it is a part of Orcutt's invention to make the rand lip a part of the teeth; yet if made separate, it would still be Orcutt's cutter. And in Cross-Int. 119, he states that this results from the fact that Orcutt's cutter is sharpened by grinding the flat front face of the teeth, and has a rand disk or guard. Then again he informs us that there is originality in Orcutt's using a rand disk with a cutter formed on the top face with the rand lip, bed, bead, and guard, and capable of being ground on the flat front face (Cross-Int. 120). This witness also thought there was novelty in the *method* of presenting the shoe to Orcutt's cutter, because the top of the teeth acted as a guard (Cross-Ints. 127–130).

These questions are cited as a sample of the theories of this witness as to novelty in Orcutt's cutter.

COLEMAN'S DISCOVERY OF A NEW RESULT, BECAUSE THE OLD RESULT WAS INCREASED IN QUANTITY.

Coleman, complainant's expert-in-chief, could discover a *new result* in Orcutt's cutter, because the result was greater in quantity than when produced by other cutters (Cross-Ints. 175, 176, p. 70, printed record).

COLEMAN'S ERRONEOUS COMPARISON OF ORCUTT'S ALLEGED INVENTION, WITH "GIMLET-POINTED" SCREW, AND "CORLISS" STEAM ENGINE.

Among other instances of the distorted ideas of the witness Coleman, in Cross-Int. 136 he instituted an attempted parallel between Orcutt's cutter and the change from a blunt-ended to a gimlet-pointed screw. But in answer to Cross-Ints. 191–197, pp. 73–4, record, he is forced to admit that in that case a new result was produced, for the gimlet-point cut a thread for the cylindrical part of the screw; but, as already shown, every feature in Orcutt's cutter was old long before Orcutt, as well as every result and product. So, too, this witness attempts, on p. 26, Int. 7, to institute a parallel between Orcutt's cutter and the Corliss steam engine; but in answer to Cross-Ints. 243–249, he admits that Corliss produced a new result; but where is Orcutt's new result?

COLEMAN'S ADMISSION AS TO STATE OF THE ART, AND ITS EFFECT.

In conclusion, upon the question of the patentability of Orcutt's cutter, in view of the state of the art, defendants might safely, of right, rest their defence upon the admission of Coleman himself (p. 23, Int. 5), where he asserts that had Orcutt, before his invention, gone to J. R. Brown and asked for a suitable sole trimmer, and had imparted to him (Brown) the history of the art, and shown him samples of the earlier cutters, that Brown "*might very probably have brought forth a tool which would have been a success.*" "*That tool might have been — probably would have been — identical with Orcutt's, and as it would seem to me, a joint invention of the two men.*"

Coleman argues (in the space above specified) that in such case it would have been a joint invention. Not so; the law assumes, and must assume, that every man has full knowl-

edge of the state of every art, in so far as relates to his rights as an inventor therein; else the more ignorant a man was the greater would be his rights. And if Orcutt had told Brown all about the state of the art, that would have constituted no degree of invention on Orcutt's part; and if Brown had then produced Orcutt's cutter, it would (if an invention) have been his invention solely, and not his and Orcutt's jointly; because the knowledge of the state of the art is the property of every man, no matter how, when, or from whom he obtains it. Hence, Coleman's theory, that as Orcutt, occupying, as he says, the "*relation of machinist and of leather-trimming tool maker*," could himself alone obtain a valid patent, while, if Brown, when he had produced the same cutter, after being informed by Orcutt of the state of the art, could only obtain a patent jointly with Orcutt, is fallacious. Because, if Brown, after receiving from Orcutt, knowledge of what had before been done in the art, could not then obtain a sole patent, no more could Orcutt obtain a valid patent; for it could make no sort of difference whether the knowledge of the state of the art was contributed by one man, and the manufacturing skill by the other, or both were possessed by one man; for, as stated above, all that the state of the art contributes towards any attempt at invention is outside the pale of patentability. Hence, if Brown could make the cutter, as asserted by Coleman, after knowing what others had done, but could not himself obtain a valid patent for it, then that fact proves that Orcutt has made no invention, and it is and should be our ample defence to this suit.

COLEMAN'S ADMISSION OF SIMILITUDE BETWEEN TRIMMING BOOT AND SHOE SOLES, AND CUTTING OTHER HARD AND SOFT MATERIALS.

And the last preceding ground of defence is the more ample, in view of the further declaration of Coleman, that on once visiting a place where Orcutt's cutters were in use on shoe soles, "*the principles there exhibited were so like those*

with which I [he] was familiar before, in cutting soft and hard material, that I [he] deemed a repetition of examination unnecessary" (Cross-Int. 37, p. 33, printed record). Where does this statement leave all the asserted radical and incomparable dissimilarity between rotary trimmers for leather, and those for wood and iron?

BOTH COMPLAINANTS' AND DEFENDANTS' WITNESSES TESTIFY THAT ORCUTT'S AND THE OLD TAYMAN RAND CUTTERS ARE IDENTICAL.

It has been testified by Corthell (Cross-Ints. 57–60, p. 319, record) that among others Thompson's rand sole and edge trimmer and Tayman's patent cutter were substantially like Orcutt's. Mann (Cross-Int. 41, p. 331, record) gives the same evidence with reference to the Exhibit Thompson Cutter. Thompson (Cross-Int. 24, p. 342, record) makes the same statement; and Andrén (Cross-Ints. 57–61, p. 198, record) gives the same testimony in reference not only to Thompson's, but other older reference cutters, as also do other witnesses. And they are corroborated in fact by both Noble and Orcutt. Exhibit B, p. 176, record, is an extract from Noble's testimony in the Keith suit, brought for using the Orcutt cutter made by Eddy, as already stated; and Noble there testifies that *"all rotary trimmers now [then] in use, except a very few, I feel very sure not over a dozen in all, have rotary welt knives, substantially the same in all respects as that described in the Tayman reissue, and represented in the second, fifth, and sixth claims;"* and he further says, Keith is such infringer; thus showing that Noble asserted that the Orcutt rand cutter was the Tayman rand cutter, and the Tayman patent antedates complainants by more than seven years. In Exhibit D, p. 179, record, Orcutt testifies in the most positive manner that the welt cutter (rand knife) in the Tayman patent (the cutter there marked "F 2") is identical with his rand lip; he states and restates this fact. Again, Noble (p. 128, Record) testifies that Tayman's rand cutter is substantially like that in Orcutt's cutter; and as all three

of the parts in Tayman's cutter, F, F^1, F^2, are burr cutters, and have been so characterized by complainants, therefore, if Tayman's rand cutter is like Orcutt's, as Noble, and Orcutt himself, both testify, by what logic can it be said that the other parts or elements of his cutter, the bed, and guard, are unlike all other cutters? The testimony of Noble and Orcutt in the Keith suit was no doubt unwittingly given by them; and like that quoted of defendants' witnesses was, in view of the widely developed state of the art, strictly true; for in the light of the state of the art, each and every of the cutters there compared are but equivalents each of the other, devoid of all patentable novelty; and hence the defendants in the Keith suit on the Tayman patent (brought for making Orcutt's cutters, as do the defendants here) fully agreed with complainants that Orcutt's rand cutter was identical with Tayman's; and defendants leave complainants to explain why these parts of the two cutters are alike, and the other parts, having the same characteristics, are, as they claim, totally dissimilar. For the same rule of comparison must be observed in relation to all parts of the old Tayman and the later Orcutt cutters.

STEVENS, ONE OF THE DEFENDANTS, WAS THE FIRST INVENTOR OF THE CUTTER IN SUIT.

Upon that branch of the defence which relates to who first invented the cutter in controversy, (supposing it to have been an invention), attention is called to the fact that Orcutt himself is not called by complainants to give any evidence upon that question; and that he has never testified that he invented anything that is now in controversy, because nothing now claimed in his patent was even described, much less claimed, in the specification that he swore to. For he swore that his invention consisted "*in a novel method of constructing such cutters, whereby the necessary*" backing off, "*so called, or clearance of each cutting blade is readily and easily produced*"; and further that "*it consists in the use of a series of blades detachably secured to and projecting outward from a common*

hub, and having their outer or peripheral ends or edges moulded to a uniform shape, the counterpart of the shape that it is desired to give to the sole edge." Thus his invention consisted of two features: one, a method of producing the "*backing off*," which was by moulding his teeth in a construction hub, and then inserting them in another hub, which changed their angle, and so produced "*backing off*" or clearance; the other feature consisting in "*a series of cutting blades detachably secured to and projecting outward from a common hub*," and having the desired peripheral form.

After this application had been repeatedly rejected, as well as "*tinkered*" by amendments, as appears on pages 222–235, record, copy of Patent Office file wrapper and contents, the drawing was cancelled, and all of the specification, except the signature, erased; and a new drawing and specification, executed only by Lombard, Orcutt's attorney, was substituted; thus showing, not negatively, but positively and affirmatively, that such new substitute specification was never sworn to; for however much one may do as the attorney of another, he cannot subscribe an oath for and in place of his principal; for vicarious oaths are unknown to the law in this behalf so long as the principal is living. Hence, the statement is repeated that, in so far as Orcutt is concerned, he is in no respect a witness upon the question of whether he first or ever invented the cutter in suit. The testimony as to who invented the cutter in question is as follows: Stevens, the defendant, who claims to be the first inventor, testified (printed record, p. 328. Ints. 2, 3, 4, 5, 7, 10) that in August, 1878, he first made a moulded cutter, as an experiment; several months after that made a second, then a third; it was like complainants'; the first was made for S. N. Corthell. In the fall of 1878, or winter, made cutters for Noble, like that shown in Orcutt's patent, except there might be more or less teeth. Int. 11: Stevens made first Corthell cutter like that in his patent No. 207,395, dated Aug. 27, 1878. Int. 12: Had a conversation with Noble about the Corthell cutter and turning the blades the other side up; "*result was I made the cutter as suggested.*" Int. 13: It had

inserted teeth. Int. 14: Between the times of my making the first and second cutter for Noble, he had one made by somebody else, I suppose, on Charlestown Street; he brought it in and showed it to me; we talked about putting in more or less blades. Int. 16: Noble said the first cutter worked beautiful. Int. 17: The next cutter I saw came from Brown & Sharpe's; Noble said he had it made there as they held a patent on the method of "*backing off*." Int. 18: This was in spring of 1879. Int. 19: Made first cutter for Noble in October or November, 1878.

Gough, one of defendants' witnesses, testifies, p. 146, record, Int. 4: Worked for D. Whittemore from January, 1878, till May, 1879. (This was when Stevens made the cutters.) Int. 7: Saw Stevens experimenting for Noble; made two cutters for him like Orcutt's. Noble took them off to try them. Thinks this was in last of August or first of September, 1878 (about a month earlier than stated by Stevens, and near as could be expected at this time). Ints. 9, 10: States how he fixes date of Stevens' making cutters for Noble (and he is evidently correct). Int. 11: Witness states that Noble was back and forth nearly all the time while Stevens was making the Orcutt cutters for him.

Stevens, pp. 166–7, testifies that during the negotiation of Noble to hire him and Corthell away from the Corthell Company in 1882, Noble stated that it was a mistake that the Orcutt cutter had not been patented in Stevens' name, as he was the first to get it up; that this was said in connection with Stevens' testimony in the Corthell suit; and Stevens reiterates that said testimony was true, and that he did not then nor now believe that it was a patentable invention, and hence made no effort to patent it.

Leavitt (formerly our witness, now complainants', as explained) testified in the Corthell suit, p. 347, printed record, Ints. 5, 6, 7, that after the consolidation of complainant company and Whittemore, Noble was in the habit of being there looking after edge trimmers that Whittemore was making for him; and that the services of Stevens were placed at Noble's disposal, and he worked under Noble's in-

structions, experimenting for him in the spring and summer of 1878. Int. 8: Leavitt states that he had a conversation with Noble in March or April, 1878, at Whittemore's, about trimming cutters; suggested to Noble the idea of making them after Brown & Sharpe cutter; also spoke of the effect of Brown patent in regard to its use for boots and shoes and leather. Int. 9: Noble made no reply. I was impressed with the idea that he took the suggestion. Int. 10: Noble's experimenting was done after that. Ints. 14, 15: While Stevens was under Noble's direction at Whittemore's he worked directly under Noble's instructions, and I could not describe the cutters that he made for him. I was then foreman at Whittemore's.

And on page 273, record (which is his affidavit used by complainants at the preliminary hearing in this suit), Leavitt seeks to avoid his answer to above stated Int. 8, by stating that his suggestion of making trimming cutters like Brown & Sharpe's only related to forming the cutter in one piece; that it was a hot day when he made the suggestion, instead of in March or April, and he there asserts that he never thought of the Brown & Sharpe milling cutter in connection with trimmers, until Noble showed him an Orcutt cutter; nor ever heard of such suggestion till after Noble showed him the Orcutt cutter. This witness there further states that, "*What Stevens was directed to make when he was experimenting under Noble's instructions I should not be likely to know, but I feel sure that I do know all the work he did, including what he did when he was working under Noble's instructions.*" Thus, the witness feels sure that he knows what he declares he would not be likely to know.

This witness then glibly rehearses the tale as told by other witnesses (without variation or mistake) that "*it seems plain to me* (him) *that this* (Orcutt's cutter) *is a novel and valuable idea.*" It would be amusing, were it not a waste of time, to trace this expressive and uniform statement through the long orations (two, three, and four pages long, in a single answer) where this belief is asserted and reiterated. Leavitt also contradicts Corthell in the matter of the date fixed by Cor-

thell, Int. 54, p. 319, record, where Corthell states that it was in the summer of 1878 that he first saw a Brown & Sharpe cutter adapted to trim soles, and that in the spring of 1878 Leavitt suggested to him the idea of making Corthell's moulded cutter on the same principle as Brown & Sharpe's, and that others suggested the same idea. Leavitt admits all but the date; that he contradicts; but when a witness is hired to contradict himself, he may be expected to contradict others, in order to give his testimony a consistant appearance of "*general average*."

The only other testimony on this point is that of Mr. Noble, complainants' general manager; and it is not proposed to analyze his, but only to contrast his own statements one with another, and in a few instances with the testimony of other witnesses.

The testimony of Noble in relation to the date of the advent of Orcutt's cutter is spread over a large space; pp. 122 to 132; 267 to 272; and 292 to 298, printed record. And the following synopsis of the material statements therein, as regards the dates of the earlier occurrences connected with that cutter, is given as follows: Int. 13, p. 293, printed record, Noble testified that he first heard or knew of Orcutt's cutter "*between August*, 1878, *and January*, 1879." This testimony was given before Noble realized what might be its effect upon their case, and he attempts to evade its force (p. 271, record), by claiming that he meant an Orcutt cutter in one piece. But it is submitted that this attempt is palpably clumsy, for at that very time he testified (Cross-Int. 27, p. 296, printed record), that cutters in one or three pieces would be Orcutt's cutter. Besides, it is apparent from his statement on p. 268, printed record, that no Orcutt cutters, in one piece, were made till 1879. And further, on Jan. 2, 1879, when Orcutt swore to his application for his patent (p. 222, record), he had no idea of any cutter except a cutter with inserted teeth; hence, if Noble, as he testifies on p. 271, record, meant a cutter in one piece, when he answered Int. 13, p. 293, record, his answer was false, because no Orcutt cutter in one piece was made till he

went to Brown & Sharpe in January, 1879, as already quoted from p. 268, record; hence he could not have seen one between August, 1878, and January, 1879.

Noble testified (Ints. 4, 5, p. 292, printed record), that between Jan. 1 and March 1, 1879, he went to Brown & Sharpe's with "*rough drafts*" and "*templates*" and "*engaged*" them to make the Orcutt cutter. And it is clear from Noble's statements on p. 268, printed record, that but three Orcutt cutters, as he, Noble, claims, were ever made before he went to Brown & Sharpe's; one made by Orcutt and two by Stevens (see pp. 268–9, printed record); while on p. 123, printed record, Noble testifies to the delay of getting ready to make the Orcutt cutter in sufficient varieties of styles to "*start at all.*" And on said p. 123 he swears positively that Orcutt's cutter was *first* put on the market in the fall of 1879. Yet in Int. 14, p. 293, Record, he swore just as positively that Orcutt's cutter "*has been in common and very general use since the spring of* 1879." If complainants' counsel can evolve a theory that will harmonize these several statements of Noble, they will not only deserve *his* gratitude, but will do much towards establishing a reputation for greater ingenuity than was required to bring forth Orcutt's cutter.

The following tabulated arrangement of Noble's testimony as to dates is presented for handy reference: —

First heard of Orcutt's cutter between August, 1878, and January, 1879; Int. 13, p. 293, record.

Know that Orcutt first described his cutter to me in May, 1878; p. 271, record.

We commenced the manufacture of the Orcutt cutter *early in 1879;* p. 123, record.

Orcutt cutter in common and very general use since spring of 1879; record, Int. 14, p. 293.

Orcutt cutter first put on the market in the fall of 1879; record, p. 123.

First went to Brown & Sharpe's to have Orcutt cutter made between Jan. 1 and March 1, 1879; record, Int. 5, p. 292.

I went to Brown & Sharpe's first to have cutters made in January, 1879; p. 268, record.

My impression is that I showed Orcutt cutter to Leavitt before August, 1878; p. 271, record.

Know I saw an Orcutt cutter as early as August, 1878, and showed it to Leavitt; p. 271, record.

Have had much difficulty in settling when I first had knowledge of Orcutt's invention, and have not been able, as yet, to determine definitely just when I first saw an Orcutt cutter; p. 271, record.

Feel sure I first saw Orcutt's cutter before August, 1878; p. 271, record.

May have had talk with Whittemore & Leavitt (about Orcutt cutter) in May or June, 1878; p. 271, record.

Can't with certainty give date when I first saw an Orcutt cutter; p. 271, record.

This self-inconsistent witness is flatly contradicted in material matters by Stevens, Cunningham, Corthell, and Eddy; for although Noble attempts to discredit their testimony by his rebutting evidence, yet their testimony in such case is as equally a contradiction of his as if their testimony was in rebuttal of his. See p. 267, record, where Noble says of Stevens' affidavit that "*it is wholly false in substance.*" It "*is a falsehood without a shadow of a foundation.*" And on p. 268, record, Noble says of Stevens' testimony in matter of his suggesting that the top of the teeth be the moulded part, "*This is false except to this extent, that it was general talk that the Orcutt cutter was the Corthell cutter with the blade turned to bring the moulded surface up.*" On p. 269, record, Noble charges that Stevens' statements there specified "*are wholly false.*" Again, on same page, Noble contradicts both Cunningham and Stevens in the matter of his threat to resort to every "*mean, dirty trick*" that he could to break up their business; and also in the matter of his threat to injure their business of making and selling seam-finishers. And on p. 270, record, Noble charges that Eddy's testimony is "*unfair,*" and that Corthell's testimony is "*disingenuous.*" Thus this witness, whose own testimony

is a mass of contradictions, has no hesitation in arraying his unsupported oath against that of four other witnesses, whose testimony is in all other respect uncontradicted. And it is only by Noble's testimony that Stevens' claim to priority of invention of the Orcutt cutter is materially disputed; for Leavitt's testimony is immaterial upon that point, and is only circumstantial; while Orcutt, the inventor, either keeps aloof, or complainants dare not call him upon the question of priority; and he has never made oath that he invented complainants' cutter, but that he invented an entirely different one. Hence, it is confidently submitted that Stevens' claim to having first conceived the idea of making the so-called Orcutt cutter; which consists in arranging the teeth of the old hand-plane around a hub or common centre, as in Brown's patent of 1864, is unshaken and practically undisputed; while his reason for not attempting to patent it (because he did not believe it patentable) adds force to his testimony.

THIRD SPECIFICATION OF DEFENCE: PATENT VOID BECAUSE IT IS FOR AN INVENTION OTHER THAN THAT APPLIED FOR, OR SWORN TO.

Pages 222–240, printed record, contain a copy of the file wrapper and contents connected with the granting of the patent in suit. In the original specification Orcutt specified the nature of his invention as follows: "*My invention relates to that class of rotary cutters in which a series of cutting-blades are detachably secured to a common hub, from the periphery of which they all project outwards at a uniform angle, and is especially applicable to cutters designed to form upon the sole a fancy or moulded edge, and it consists, first, in a novel method of constructing such cutters, whereby the necessary 'backing-off,' so called, or clearance of each cutting-blade, is readily and easily produced without danger of changing the form given to the outer or peripheral ends thereof, as will be further described.*"

"*It further consists in the use of a series of cutting blades*

detachably secured to and projecting outwards from a common hub, and having their outer or peripheral ends or edges moulded to a uniform shape — the counterpart of the shape that it is desired to give to the sole edge — with their cutting corners equi-distant from a common centre, about which said cutter revolves when in use, all so constructed that each blade may be readily sharpened by grinding its front radial face without danger of changing in the least the form of its moulded edge, said blade being readily removed from the hub for the purpose of sharpening upon a common grindstone, if desired, when a thin emery wheel and suitable mechanism for grinding the blade in the hub is not readily accessible." See pp. 223–4, printed record.

Orcutt then proceeded to further state in his specification that his method of producing "*clearance*" was by inserting the blades of his cutter in a hub, and turning off the periphery, so that the outer face of each tooth constituted an arc of a circle having the axis of the hub as its centre; after which he removed the blades from that hub, and after hardening them he inserted them in a hub so formed that each blade was at a different angle to a radial line than when being turned, and so that the rear portion of the peripheral face would be inside a circle described at the cutting edge; thereby producing "*clearance*" or "*backing-off.*" See p. 225 of record. He then claimed his invention as follows: 1st. "*The method herein described of producing the 'backing-off' or clearance in the blades of rotary cutters, which consists in turning off the outer or peripheral edges of said blades while set at a given angle, and then setting them in the hub in which they are to be used, at a different angle, substantially as herein set forth.*" 2d. "*A rotary cutter provided with a series of cutting blades detachably secured to a common hub and having their front and rear radial, or nearly radial, faces parallel to each other, and their outer or peripheral edges moulded to a counterpart of the desired ornamental shape to be given to the sole edge, and adapted to be sharpened by grinding the front radial face of each blade without changing the shape of its moulded peripheral edge, substantially as and for the purpose described.*"

The application thus prepared and presented was five times rejected, upon the original, and various modifications thereof, such rejections being based upon patents to "*Corthell*," Brown, and Harrington; and was then submitted to Examiner Jayne, — an officer of most extended and varied experience, — upon the question of novelty, as regarded claim 1, which Mr. Jayne held to be fully anticipated by Brown's and Harrington's patents; this action being made May 29, 1879. No further action was taken by Orcutt till Jan. 4, 1881, when, as appears on page 230, printed record, all of the amendments and all of the original specification except the signatures was erased and the original drawing was cancelled; and a new specification and new drawings were substituted; wherein both the peculiar method of producing the "*backing-off*" and the feature of insertible teeth (which constituted the sole elements of novelty in the original application) had disappeared, and the following "*attorney's invention*" had been substituted therefor, to wit: "*The main feature of my invention consists in the blade thus formed with a flat front face and a moulded or fancy top surface, the converse of the sole edge, and having the ridge 1, or the ridges 2, 2, either or both extending across its top surface — that is, extending from front to back, as shown in the drawings . . .*

"*Each blade* d *is shown in this instance as a distinct (misprinted, "distant" in the record) piece secured to the hub* d, *substantially as in United States patent, No. 82,402 to Harrington, dated Sept. 22, 1868. (One of the references in former rejections.) My invention, however, does not relate to the mode or process of manufacture, but to the article of manufacture, and the blades and hub may be of one piece, and constructed by any suitable mode or process too well known to need description, and I disclaim both the cutters and both the modes of manufacture described in the patent to Harrington above named and in the patent to Brown, No. 45,294, dated Nov. 29, 1864.*" See p. 231, printed record.

Orcutt's attorney then disclaimed all that was shown in either of the reference patents on which he had accepted

rejection upon his original application; and he concluded his amended specification with the following claim: "*A rotary cutter for trimming sole edges, the blades* d, *of which are formed with a flat front face* a, *and a top* c, *the converse of the edge to be trimmed, and which has a proper clearance and is provided with one or more circumferential ridges 1, 2, 2, for taking out the rand or forming a bead on the sole edge, or both, as above described.*"

Thus it is clear that when Orcutt first entered the Patent Office, in connection with the patent in suit; he asked protection for two things: 1st. "*The method of producing the 'backing-off' or clearance*"; which consisted in turning to desired form the peripheral faces of the cutter-blades, while held in a hub at a certain angle, and then setting them in the hub in which they were to be used, at a different angle. 2d. A rotary cutter, provided with cutting-blades *detachably* secured to a common hub and with their front and rear radial or nearly radial faces parallel to each other, and with a duly moulded peripheral face. See claims in original specification, p. 222, printed record, — at bottom, — already quoted. While in his amended specification he asserted that his invention related neither to the mode of production nor to having the teeth insertible, as at first claimed. See p. 231, 3d section from top, printed record.

In response to said amended application the Examiner in charge in the Patent Office required certain changes in the claim and intimated that patentable invention was disclosed in the application. (See p. 232, printed record, action of January 8, 1881.) Thus encouraged, Orcutt's attorney erased the objectionable claim, and filed two new claims instead (see p. 233, printed record, at top). The first of these claims was refused upon reference to the Corthell patent; whereupon Orcutt's attorney erased both said claims, and filed the claims now in the patent, — the first of which is for a rotary cutter for trimming sole edges, the blades of which have flat front faces, and have their outer or peripheral ends moulded throughout to a uniform shape, the converse of the desired shape to be given to the sole edge, and slightly

eccentric to the axis of the cutter; while the second is for a cutter for the same purpose, and having the same features as are prescribed in the first claim, with the addition of the "*end ridges*" 1 and 2 extending across the face of the teeth. Hence it is apparent at a glance, and beyond question, that the alleged invention embodied in the patent in suit was not claimed by Orcutt himself at any time, but was, in the current phrase of the Patent Office, merely an "*attorney's invention*"—an afterthought, not of Orcutt, but of his solicitor. For there is no indication anywhere, either in the record or out of it, that Orcutt had any knowledge of the action of his solicitor in making said changes; thereby substituting a radically different invention for that specified in the original application which Orcutt executed.

The case of Eagleton Manufacturing Company, appellant, *vs.* West, Bradley, & Carey Manufacturing Company and Joseph J. West, 111 U. S. 400–490, would seem to be conclusive as to the sufficiency of this defence. There the original application claimed the protection of furniture springs by japan; while the application was pending, the applicant died, and the solicitor changed the application to cover a method of tempering the springs by the heat required to harden the japan. This new or amended specification, the court held, should have been sworn to by the administratrix of the inventor. If so, then it would be the bounden duty of a living inventor to make oath to his amended application, where, as in this case, nothing remained of the original application except the signatures; every line of the original description, as well as the drawing, having been wiped out in order to create a necessary field for the new invention, to which Orcutt did not make oath, and which he did not sign.

In this case, the copy of the file wrapper and contents are in the case without objection, and, as held in above cited case, need not have been pleaded; as a complainant can never be taken by surprise by reason of a record made by itself, or by those under which it claims title.

In fact, the patent now in suit is more obnoxious to the rule

laid down by this court in above cited case than was the patent there in controversy; for there the change made by the solicitor was a claim from one function of the application of japan to another; from protecting the spring, to giving it temper; while here the original application specified a method of producing clearance in the teeth, which method could only be practised with inserted teeth; while in the patent, as issued, the claim is for a cutter having either insertible or integral teeth, and produced by any possible method.

FAILURE TO MAKE OATH TO THE AMENDED SPECIFICATION.

The fatal defect of the failure by Orcutt to make oath to his radically new and different specification, is proved in several ways. The rule of the Patent Office at that time required that the oath should be upon the same paper as the amendment; and hence if there had been such oath it would now appear in the contents of the file wrapper. Again, the amendment, as appears upon its face, was executed by Orcutt's attorney, and not by himself; and hence could not have been sworn to by Orcutt, for if Orcutt was to make oath to it, he, himself, must execute it, for the oath must be administered to and subscribed by the person who executes the document to which the oath relates.

In Ramson *v.* Mayor of New York, 1st Fisher's Patent cases, p. 252, Judge Hall held that the omission of the oath required by the Federal statute was an ample defence to the patent. In Whitely *v.* Swayne, 4 Fisher's Patent cases, Southern District of Ohio, which (although a reissue case) was "*on all fours*" with this in the matter of substituting a radically different and unsworn specification for the rejected original. Judge Leavitt referred to and followed Ramson *v.* Mayor of New York, and held that "*it results clearly that the disregard of this statutory requirement (the oath) invalidates these reissues.*"

The judge, holding that the question whether the commissioner had "*exceeded his authority*," in granting a patent

upon an application not sworn to was a matter open to inquiry, and such is understood to have been the ruling in Eagleton Manf. Co. *v.* West, etc., above cited.

And in Kennedy *v.* Hazelton, 46 O. G. 973, this court held that a patent which is not supported by the oath of the inventor is void. In fact, the law seems to be so well settled, both that lack of the oath invalidates a patent, and that the failure to take the oath may be shown by the records; that complainants' patent is fatally defective in that respect.

ORCUTT'S PATENT OF MARCH 4, 1879, NO. 212,971, SHOWS ALL THAT IS CLAIMED IN PATENT IN SUIT; AND WAS ISSUED ONE YEAR AND TEN MONTHS BEFORE THE CLAIMS IN PATENT IN SUIT WERE FILED.

Upon the fourth specification of defence, dedication by issue of earlier patent, the following cited testimony, uncontradicted, shows that in Orcutt's exhibit patent of 1879 is shown every feature that is claimed in this patent in suit.

See Coleman, Cross-Ints. 129, 130, 133, pp. 56, 57, printed record; also, Cross-Int. 219, p. 82. See, also, Noble, printed record, p. 130; who, when testifying about complainants' patent, made this statement: "*The cutter shown in this patent (that of 1879) is the same as that shown in the patent in suit.*"

Moore (defendants' witness) testified, p. 150, record, Int. 5; that the only difference in the cutters shown in the two patents was that in the latter the teeth were inserted (an immaterial matter). And to same purport see Andrén, Ints. 3 and 4, p. 182, printed record.

It is clear from an inspection of Orcutt's two patents that both were prepared at the same time, and both were filed at the same date; and the only difference in the two was that in one, the patent of 1879, a method of producing clearance by bending back the teeth, was shown, described, and claimed, and in the other, that in suit, he showed inserted

teeth; the operative part of the cutter in both applications and patents was and is exactly alike, as above shown.

CASES CITED UPON QUESTION OF DEDICATION.

Upon the question whether, as matter of law, Orcutt dedicated to the public all that is claimed in the patent in suit, by the issue of his patent No. 212,971, dated March 4, 1879, which shows and describes all that is claimed in the patent in suit; and whether by an entire change in his application long after filing it, and long after the issue of the 1879 patent, the patent is void, defendants cite the following cases: Hill *et al. v.* Com. of Patents, 33 O. G. 757, decided by Carter, C.J. The chief-justice here cites Miller *v.* Brass Company, 104 U. S. Rep. 350, and Campbell *v.* James, 104 U. S. Rep. 332, and concludes: "*These cases are conclusive of the issue here. That issue is not whether the invention has been abandoned by a failure for two years to apply for a patent for it, or until the statutory limitation of two years' public use had run against the appellants, but whether, by manifesting these features of this invention in their prior patent, without covering them by claims, they had dedicated them to the public. It is the judgment of this court that they have dedicated them to the public, and we therefore affirm the decision of the Commissioner of Patents.*"

In Matthews *et al. v.* Flower *et al.*, Eastern District of Michigan, 33 O. G. 887, Brown, J., following the rule laid down by the Supreme Court, stated the case, as follows: —

"*If it were true that complainants had previously obtained a patent for the same invention secured to them by the patent in suit, and that this prior patent had expired, it would doubtless be a complete answer to this bill, since a man cannot have two patents for the same invention.*" (James *v.* Campbell, above cited; Suffolk Co. *v.* Hayden, 3 Wall. 315; Morris *v.* Huntington, 1 Paine, 34.) "*And this disability extends not only to what is claimed in the first patent, but to that which is described therein as the patentees' invention.*" "*If a man cannot have a patent for what another has claimed or de-*

scribed in a prior patent, much less can he have one for what he himself has claimed or described, for he thus shows that he has anticipated himself."

In Chicago and Northwestern Railway Company, appellants, *v.* Searles, 97 U. S., 554, 15 O. G., 243, the Supreme Court passed upon this very question, and in their opinion they said: "*It will be observed that we have given particular attention to the original application, drawings, and models filed in the Patent Office by Thompson & Bachelder. We have deemed it proper to do this, because if the amended specification and model filed by Tanner (assignee of Thompson & Bachelder) five years later, embodied any material addition to or variance from the original, anything new that was not comprised in that, such addition or variance cannot be sustained on the original application. The law does not permit such enlargements of an original specification which would interfere with other inventors who have entered the field in the meantime, any more than it does in the case of reissues of patents previously granted. Courts should regard with jealousy and disfavor any attempts to enlarge the scope of an application once filed or of a patent once granted, the effect of which would be to enable the patentee to appropriate that which has, in the meantime, gone into public use.*" The decree of the Circuit Court was reversed, with directions to dismiss the bill.

In James *v.* Campbell *et al.*, Clexton *v.* Campbell *et al.*, Campbell *v.* James *et al.*, 104 U. S., 382, 21 O. G., 337, the Supreme Court stated: "*It is hardly necessary to remark that the patentee could not include in a subsequent patent any invention embraced or described in a prior one granted to himself, any more than he could an invention embraced on described in a prior patent granted to a third person. Indeed, not so well, because he might get a patent for an invention before patented to a third person in this country, if he could show that he was the first and original inventor, and if he should have an interference declared.*"

In Mahn *v.* Harwood, 112 U. S., Rep. 354, the court held that, "*The taking out of a patent which has (as the law requires it to have) a specific claim, is notice to all the world, of*

the most public and solemn kind, that all those parts of the art, machine or manufacture set out and described in the specification and not embraced in such specific claim, are not claimed by the patentee, at least not claimed in and by that patent. If he has a distinct patent for other parts, or has made application therefor, or has reserved the right to make such application, that is another matter, not affecting the patent in question. But so far as that patent is concerned, the claim actually made operates in law as a disclaimer of what is not claimed; and of all this the law charges the patentee with the fullest notice.

In the Suffolk Company *v.* Hayden, 2 Whitman, 140, 3 Wall., 515 (error from this District), the Supreme Court held that where an application for a patent was filed in 1854, claiming certain specific improvements, and while yet pending, the inventor filed, in 1855, a second application, in which he showed and claimed, in combination with other matter, what was claimed in the earlier application, and on this later applicatiou a patent issued in 1857. And the earlier application being still pending, he, in 1857, filed a new application for what was embraced in the first application, which application of 1857 was allowed and the patent issued that year. And in 1860, a patent was issued on the first application, filed in 1854. The court held that the patent issued in 1860, on the 1854 application, was valid. The patent issued in 1857, on the application filed in 1857, for the same subject, matter as was embraced in the 1860 patent, was void. And the disclosure in the patent issued in 1857 on the 1855 application did not dedicate to the public what was then, and had all the time been, claimed in the application filed in 1854. Thus upholding the later patent, because the subject-matter thereof was *claimed* at the time when the earlier patent (which disclosed the same subject-matter) was issued. But in the present case almost two years elapsed after the issue of his 1879 patent, and the insertion in his other application of the claims in the patent in suit, which cover exactly what was shown but not claimed in the earlier patent.

In *ex parte* Cottrell, Commissioner's Decisions, 9 O. G., 495, Duell, Com., where this question arose, he held as follows:

"But when the invention, or any part of it, is sufficiently described, but is not claimed so as to be protected by the original grant, a remedy is provided by law, not by filing a second independent application, but by reissuing the original application. . . . Such being the remedy prescribed by the law, to permit parties to pursue another course, and set up such matter in other and independent patents, would be to ignore the statute, and allow applicants to make a law unto themselves."

The Commissioner then points out, that, in accordance with Grant *v.* Raymond, 6 Peters, if a patent be granted showing, but not claiming, certain features, for which unclaimed features a subsequent patent is granted, that such subsequent patent would be no bar to claiming the same features in a reissue of the first patent, and he concludes as follows: —

"The only safe and proper course, then, to be pursued, where an applicant wishes to make a certain device, described but not claimed in one application, the subject of another patent, is to clearly state that intention in the first application (which Orcutt did not do). By this means a division is made, and the world notified of it."

If he omits to do this, his only proper course then is to reissue and divide his first patent in the manner the law directs.

In Marvin *v.* Lillie, Supreme Court, District of Columbia, Olin, J. (an appeal from the Commissioner on an interference; and this question being involved among others), the court held that a subsequent patent could not claim what was shown, but not claimed, in an earlier patent, but that a reissue of the earlier patent was the only proper remedy.

In Miller *v.* Brass Co., 104 U. S., 350, 21 O. G., 201, the Supreme Court stated its views as follows: *"But it must be remembered that the claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, are in law a dedication to the public of that which is not claimed."*

CASES CITED IN SUPPORT OF DENIAL OF NOVELTY IN COMPLAINANTS' CUTTER.

In support of defendants' denial of novelty in Orcutt's alleged invention, and that it is but a mere *double use*, they cite the following decisions, as pertinent to the question at issue:—

In Tucker *v.* Spaulding, Supreme Court, in error to Circuit Court, District of California, 5 Fisher, 299, 13 Wallace, 453, 10 O. G., 144, the court held that a square plate mounted to rotate upon a shaft, and having a cutter mounted at each corner and adapted to cut tongues and grooves, mortises, etc.; and cited as a reference to an inserted tooth saw; and although the method of the insertion of the saw teeth was different from that of the cutters, yet the Court below erred in refusing to submit to the jury the earlier patent for the cutter, upon the question as to its anticipating the invention of the saw; such refusal being based upon the dissimilarity of use of the two things.

The office of a saw is to sever; the office of the cutter was to form tongues, grooves, mortises, etc. The office of all rotary cutters is the same, to mould a path; the only difference is the kind of material operated on.

In Bush *v.* Fox, Goodeves' Cases, 62, appealed to court of Exchequer Chamber, and thence to the House of Lords, it was held that a caisson having air locks to allow workmen to enter and leave, and for withdrawing excavated matter, made to be used on land, and only so used, anticipates a similar device made to be used in the water. Here was clearly a double use, and hence not patentable, but were not the conditions more dissimilar than either using the tooth of the hand-cutter on a rotary hub, which was the common method of using a great variety of cutters for the same purpose, or of using a cutter, well known in working metal, to cut leather in an old and well-known way?

In Browne *et al. v.* Piper, 91 U. S. Reports, 37; 10 O. G., 417, the Supreme Court held that means for preserving fresh fish in a close chamber and a freezing mixture in a separate

chamber, were anticipated by a similar apparatus for preserving corpses, and also by cream-freezers. The relative similarities and dissimilarities between cutting leather and metal in an old and well-known manner, and preserving dead humans and herring by old and well-known means, present so many obvious parallels that space need not be occupied therewith.

In Collins Company *v.* Coes *et al.* 28 O. G., 1010, Judge Gray held that notwithstanding the fact that the step on complainants' wrench served the additional purpose of a support for the parallel screw rod, by which the movable joint is adjusted, yet there was no invention in combining the step and its securing nut in a wrench having the parallel screw rod, over the Dixie wrench which had no such parallel screw rod, the change lacking novelty of invention, thus overturning former decisions upon a similar question.

In Pennsylvania Railroad Company *v.* Locomotive Engine Safety Truck Company, 110 U. S. Reports, 490, the court held, that "*the employment in a locomotive engine of a truck or pilot wheels fitted with the pendent links, to allow of lateral motion to the engine as specified, whereby the drivers of said engine are allowed to remain correctly on the track, in consequence of the lateral motion of the truck, allowed for by said pendent links when running on a curve, as set forth,*" was not patentably novel in view of the fact that such trucks were common in cars. In deciding this case adversely to the opinion in the lower court, the Supreme Court reviewed a number of cases, both American and English, in which it is reaffirmed that the use of that which is old, to a different use or purpose, is not patentable, unless something new is produced; as in Crane *v.* Price, where the use of anthracite coal instead of bituminous coal was held patentable, because "*a new metal or composition of matter was produced.*" And so in Smith *v.* Goodyear Dental Vulcanite Co., the patent was upheld because "*a new product was the result, differing from all that had preceded it.*"

While in the English case of Harwood *v.* Great Northern Railway Co., cited by the court in the above case, which was a suit upon a patent for railway rail-fishes having a longitudinal groove to receive the heads of the bolts, the patent was upheld in the lower court, and affirmed by the Court of Queen's Bench; yet this decision was unanimously reversed in the Exchequer Chamber, and such reversal was affirmed in the House of Lords, upon the ground that as channelled iron was not new, it could not be patentable to combine the same with railway rails, yet it was obvious that, as stated in the patents, the sinking of the bolt-heads in the channel not only held the bolt from turning (as in the former use of channelled iron), but it "*avoided the danger of the flanges of the wheels of the carriages striking against the heads.*"

If the combination of a pivoted truck frame, having a swinging bolster, with the rigid driving-wheels of a locomotive, was not patentable, by reason of its obviousness, after such truck frame and bolster had been used at both ends of cars, how can a patent be sustained for putting one old and well-known kind of teeth in the same position that other teeth have been long used in for the same purpose, when the product is the same as when the teeth were used in the earlier manner?

So in Stimpson *v.* Woodman. 6 Wall., 117, it was held that, in view of the fact that a "*pebbled*" roller had been used by hand, to compress, smooth, and figure or ornament leather, and a smooth roller had been used in a machine to compress and smooth leather, that there was no invention in combining the pebbled roller with the machine.

In Double Pointed Tack Co. *v.* The Two Rivers Manuf. Co., 109 U. S. Rep., 117, Supreme Court; the second claim was for the combination of the double-pointed tack (a staple, in fact) and a washer placed upon the upper arm of the tack between the wooden vessel and the bail. And the Supreme Court held that this was not a patentable combination, as the washer performed the same duty that

it would with any other tack or staple. In view of this decision, how can it be claimed that there is any patentable combination between complainants' hub and the teeth? The hub is old, and so are the teeth; and when brought together, each performs the same office that it did before; the teeth cut the leather and produce an old effect; and the hub revolves, just as it had before done, and just as the hubs of all rotary cutters revolve.

Stephenson *v.* Brooklyn Cross Town Railway Co., 31 O. G., 263, was a suit upon three patents, one of which was for the combination of signal-cords at the sides of the car overhead, a bell at the front platform for each cord, and pull-cords depending from the overhead cords so as to be in easy reach of the seated passengers. It was old to have pendent cords from a central overhead signal-cord; and it was old to have side signal-cords; but it was new to combine the overhead side cords with pendent cords; but the Supreme Court held it not a patentable combination. Another of the patents in issue was for the combination of the car-hood, over the front platform, a glazed opening in the front and rear doors, and a mirror arranged in the hood at such an angle that the driver, without turning his head or negleting the horses, could see the interior of the car and the rear platform; a very useful contrivance, but the court held the patent void for want of novelty; it was obvious, and not invention.

In Vinton *v.* Hamilton, 104 U. S. Rep., 485, cited approvingly by the Supreme Court in Thompson *et al. v.* Boisselier *et al.*, 31 O. G., 377, it was held that "*a cupola furnace being old, and a cinder notch being old, and the use of a cinder notch to draw off cinders from a blast furnace being old, and the cinder notch in drawing off the cinder from a cupola furnace performing the same function as in the blast furnace, the application of the cinder notch to the cupola furnace would occur to any practical man, and that there was nothing patentable in such application.*" So in this case, the teeth of the hand tools were old, a hub surrounded by sole trimming

teeth was old, the teeth of the hand tools performed the same office and produced the same result when placed around a hub as when used by hand, hence their use with the hub was obvious. And in Hall *v* McNeale, 107 U. S. Rep., 90, also cited by Judge Blatchford, in Thompson *et al. v.* Boisselier, it was held that a cored conical bolt in a safe, with a screw thread on it, having existed before, and also a solid conical bolt, it was no invention to add the screw thread to the solid conical bolt; yet it was as much invention as to substitute the teeth of the hand-plane for other teeth that had long been in common use on a rotary hub.

And in Morris *v.* McMillan, 112 U. S. Rep., 244, the Supreme Court held that it was not new to combine a hoisting-engine with a capstan, the two being connected together by gears and shafting, because an engine had been so connected with a windlass; and although the barrel of one was vertical and the other horizontal, yet there was no novelty.

In Blake *v.* The City and County of San Francisco, 31 O., G. 380, the Supreme Court held that there was no novelty in combining a relief-valve with the water-hose of a fire-engine, in view of the use of such valve on steam-boilers.

In Hailes *v.* Van Wormer, 20 Wall., 353, 111 U. S., 604, now fortified and reënforced by repeated reaffirmations, it was held that taking a fire-pot from one stove, a flue from another, and a coal reservoir from the third, and putting them together in a new stove, was not patentable, where each performed the same duty as before.

In Thompson *et al. v.* Boisselier *et al.*, 31 O. G., 377, the Supreme Court discussed the question, whether invention, as required by the Constitution and the patent law, was proved by the fact that the thing patented was both new and useful; and the Court held, "*it is not enough that a thing shall be new in the sense that in the shape or form in which it is produced it shall not have been before known, and that it shall be useful, but it must under the Constitution and the statute amount to an invention or discovery.*"

Thus the Supreme Court asserts the rule that a thing may be both new in form, and useful, and yet not be patentable. Hence, while a thing must be new and useful, to be patentable, it does not follow that because it is new and useful, it is patentable.

In Brady *v.* Atlantic Works, 107 U. S., 192, 23 O. G., 1333, the Supreme Court held that it was not new to combine, in a vessel, with the propelling screw, a modified screw, called a mud-fan, arranged at the forward end of the vessel, because vessels had been moved stern first to stir up mud-banks by the rotary action of their propelling screw; the court asserting that it would occur to any one to place the mud-disturbing screw at the other (or forward) end of the vessel. So we assert that it would occur to any one, and did occur to Leavitt and Noble, that "*turning over*" the teeth in Corthell's cutter would be Brown & Sharpe's cutter, or Orcutt's cutter. And the change of position of the mud-fan from the stern of a vessel, and applying other screws at the stern for propulsion, was more nearly an invention than to turn Corthell's cutter teeth to the position shown in Brown & Sharpe's cutter.

In Harrison *v.* Grand Street Railway Co., 107 U. S., 649, the court held that putting an additional pane of glass in the fare-box opposite to that next the driver, so that the passenger can see the interior of the fare-box, was not patentable. So, too, "*combining the fare-box, the head-light of the car and the reflector, are the elements of the combination claimed for lighting the interior of the fare-box at night, and it is void; as it is simply making in the top of the fare-box an aperture, through which the rays of the head-light are turned by means of the reflector.*"

And in Smith *v.* Nichols, 21 Wall., 112, the Supreme Court laid down the rule, that "*a mere carrying forward, or a new or more extended application of the original thought, a change only in form, proportions, or degree, the substitution of equivalents, doing substantially the same thing in the same way, by substantially the same means, with better results, is*

not such invention as will sustain the patent." Complainants have not even put a new form on Brown's cutter, but an old one, Dunham's. They have adopted an equivalent means of using Dunham's cutter by substituting the old system of rotation for that of reciprocation.

In Gardner, *vs.* Hertz, 118 U.S., p. 193.

The Supreme Court, referring with approval to a then recent case, said: The specified patented combination did not before exist, but it existed with the exception of two pieces of mechanism, and their use was for the purpose of doing what they did in the combination was well known, and it was held that the alleged combination might have been made by an intelligent mechanical workman with no other instruction than that contained in a prior patent to the same inventor, and that there was no novelty in the combination sufficient to constitute a patent. In regard to another branch of the case it appeared that taking two prior separate inventions together, every element in the patent in question was to be found in one or the other of those inventions, and it was held that the combination of the two prior inventions did not require an exercise of such an amount of ingenuity as to entitle it to the protection of an exclusive grant. So here, every feature embodied in complainants' cutter is found in either the old Brown cutter, or the still older hand-plane; and when brought together they but trim a shoe in an old and well-known manner by rotary motion, and the product is identical with that of the hand-plane.

In Gardner *v.* Heiz, 118 U.S., 180. Improvement in chair-seats.

The alleged invention was for a new article of manufacture, consisting of a chair-seat made of laminæ of wood glued together, with the grains in one layer crossing those of the next, concave on the upper surface, convex on the lower surface, and perforated.

Veneers with the grains of the successive layers crossed and cemented together were old.

Perforated chair-seats of metal and gutta-percha were old.

Shaping the material, when pliable, in a matrix or former, was old.

The court said, –

(p. 189) "Gardner merely applied a process that was old to a material that was old to obtain an old form; and, considered as a combination, it is hardly possible to believe that the perforations or the concavity performed any new functions in the Gardner seat.

"An ingenions feature has been presented to the effect that the perforations and concavity coöperate in Gardner's seat to prevent warping and curling of the material used.

"If this is true, the same elements were combined in the Baillie chair-back, and performed there the same functions, etc.

"It may be that the Gardner seat is mechanically a better seat than any which preceded it; but his improvement is not a patentable one."

Miller *v.* Foree, 116 U.S. 22. Finishing tobacco plugs.

The alleged invention was for impressing letters or marks upon the plugs of tobacco during the process of manufacture.

It was found that impressions of letters and figures had for a long period been made by compression upon plastic substances, such as cakes of soap and chocolate, bars of lead, balls of butter, sealing-wax, and the leather covers of books.

The court held that there was no invention in this, and stated that the ruling already made in Penn. R.R. Co. *v* Locomotive Truck Co. 110 U.S., 490, applied in this case; viz., —

"The application of an old process or machine to a similar or analagous subject, with no change in the manner of applying it, and no result substanially distinct in its nature, will not sustain a patent, even if the new form of result has not been before contemplated."

Hollister *v.* Benedict. Revenue Stamp.

In this case the court found that the thing claimed was new and very useful, yet it was held not to be such an improvement as was entitled to be regarded in the patent law as an invention.

Reckendorfer *v.* Faber, 92 U. S., p. 347.

The court held that where, as in this case, a patent is for an alleged combination of old elements, and the product is also old, it is the duty of the complainant to prove that some one of the elements of the combination does perform a new function, not merely to be more useful than before, but perform a function which it never before performed. This bounden duty of complainants has been utterly ignored and neglected in this suit.

In the case of Pickering *v.* McCullough (104 U. S., 310), crucible machine, the complainant was assumed by the Supreme Court to have been the first to combine, in a crucible moulding machine, an external-forming mould and an internal-conforming rib, by which a greatly improved crucible was produced; such rib being so arranged as to be withdrawn from a crucible having a contracted opening at the top. Yet the court held that it was not a patentable combination, in view of the fact that the external mould had been before employed, the potter shaping the interior of the crucible with his hand, by forcing the material against the revolving mould; and the interior rib had before been employed, the potter using his hand to shape the exterior of the crucible, while the rib formed its interior.

In Heald *v.* Rice, 104 U. S., p. 737, the claim of the patent was for a *combination* of a straw-feeding attachment, with a return-flue boiler. It was admitted that the combination of the straw-feeding attachment with a fire-box boiler was old, and was shown in a patent to one Morey. It was also admitted that the return-flue boiler was old. And it was shown that the attachment was worthless when used with a fire-box boiler.

In the opinion holding this patent invalid Mr. Justice Matthew says (p. 756) : —

"The application of it (the straw-feeding attachment of the Morey patent) "to the return-flue boilers, although these were not actually known to the inventor, is merely a *new and analogous use* of an old device, operating in the very manner intended by its inventor, and the use of which, in the new application involved no invention, and could not therefore be the subject of a patent."

Now, this case and this language applies exactly, we say, to the use of the old hand-plane teeth in the Orcutt cutter.

In Tucker *v.* Spalding, *supra*, the patent in question was for a *combination* of a circular disk with removable saw-teeth. The defendants showed a prior combination of a circular disk with removable cutters for use in cutting tongues, grooves, and mortises. These cutters were attached to the circular disk in a different manner than were the saw teeth of the patent sued on. In the opinion Mr. Justice Miller says (p. 455) : "If what it (the prior structure) actually did is in its nature the same as sawing, and its structure and action suggested to the mind of an ordinary skilful mechanic this *double use* to which it could be adapted without material change, then such adaptation is not invention, and is not patentable."

It would be difficult even to imagine a case more exactly identical with the present one than that last above referred to.

The principles enunciated, and the rules laid down in these decisions, have been so invariably followed by all the Federal courts of the country, that it would be of no practical use to attempt to cite the long list of even the more prominent suits that have been passed upon in accordance with the principles laid down in Hailes *vs.* Van Wormer, and other pioneer cases, which founded the salutary doctrine of combinations in a strictly legal sense, as contrasted with mere aggregations or selections of what was old, without new function or result.

In conclusion, it may be said that complainants' patent is

fatally defective, in that Orcutt failed to comply with the constitutional requirement of paying to the public the consideration of an invention, upon which every valid patent must be based. For it is obvious, from a careful scrutiny of the decisions of the Supreme Court, that year by year the measure or scope of invention required, as the basis of a valid patent, is being enlarged and extended; and the just and obvious reason resides in the fact that the widened, deepened, and universally diffused knowledge of the arts renders a higher standard of improvement requisite to entitle the applicant to a patent; it is but applying the just rule, that "*of him to whom much is given much will be required.*" This doctrine has been so forcibly and unanswerably enunciated by this court in the cases above quoted, as to require no further citations.

Further, that Orcutt has produced no new result or product; nothing new in the velocity of cutters for this purpose; nothing new in the manner of presenting the shoe to the cutter; nothing new in sharpening the cutter; no new style of sole edge; no new method of trimming soles; no part of the sole is trimmed by a rotary cutter that was not trimmed by rotary cutters before; that Orcutt's cutter has nothing new in the rake of the teeth; nothing new in the clearance of the teeth; that complainants do not even attempt to deny that two of the old Colt's armory cutters are not only Brown cutters, but are of the proper form to trim old and well-known styles of sole edges; and defendants bring overwhelming proof that those cutters trim soles well.

That complainants admit that the rand lip in Orcutt's cutter was anticipated by the Tayman patent, and they fail to show how that part of their cutter and patent can perish for want of novelty, and the other parts survive.

That, as stated by Andrén, Brown's patent was not for any style or peripheral configuration of cutter; hence Brown had the legal right to make his cutter in every known form without let or hindrance from any subsidiary patent; and the form claimed in claim 2 was old when Orcutt was born; while in claim 1, all forms of sole edges are included; hence it